October 31, 2018

Ms. Debra Dorsey
AES Project Officer
U.S. Environmental Protection Agency, Region 7
11201 Renner Boulevard
Lenexa, KS 66219

RE: Preliminary Remedial Design Report
Cherokee County Site – OU8 Railroads, Cherokee County, KS
U.S. EPA Region 7 AES Contract No. EP-S7-05-05;
Task Order No. 0073
EPA Task Order Project Officer: Elizabeth Hagenmaier

Dear Ms. Dorsey:

HydroGeoLogic, Inc. (HGL) is pleased to submit one electronic copy of the Preliminary Remedial Design Report for the Cherokee County Site – OU8 Railroads, Cherokee County, KS. This document was prepared in accordance with Task Order 0073 and our EPA-approved task order proposal dated February 15, 2017.

Should you have any questions or comments, please contact us at 913-317-8860.

Sincerely,

Andrea Fletcher
HGL Task Order Manager

W. Alan Rittgers, P.G.
AES Program Manager

Enclosures

PRELIMINARY DESIGN LETTER REPORT FOR REMEDIAL DESIGN OF OU8 RAILROADS CHEROKEE COUNTY SUPERFUND SITE CHEROKEE COUNTY, KANSAS

TO: Elizabeth Hagenmaier, Task Order Project Officer
FROM: Chad Ferguson, HGL
DATE: October 31, 2018
SUBJECT: Preliminary Design Report and Supporting Documents, Cherokee County Superfund Site, Operable Unit 8, Cherokee County, Kansas
CONTRACT: EP-S7-05-05
TASK ORDER: 0073

This preliminary design letter report describes the remedial design (RD) prepared by HydroGeoLogic, Inc. (HGL), for the subject site. HGL is conducting this design under contract with Region 7 of the U.S. Environmental Protection Agency (EPA).

The RD activities are being performed in two phases: preliminary and final design. This preliminary design report includes the following:

- Project description and basis of design,
- Contract drawings,
- Technical specifications
- Remedial action (RA) construction schedule and cost estimate,
- Data Gap Sample Results, and
- Ecological Characterization.

This basis of design letter report will be revised and expanded as the design advances to its final stage.

Site Location, History, and Contamination

The Cherokee County Superfund Site spans 115 square miles and represents the Kansas portion of the Tri-State mining district. It consists of mine tailings, soil, sediment, surface water, and groundwater contaminated with heavy metals (principally lead, zinc, and cadmium). The primary sources of contamination are the residual metals in the abandoned mine workings, chat piles, and tailings impoundments, in addition to historical impacts from smelting operations. The Site was placed on the National Priorities List in 1983 and organized into nine subsites, which were then divided into the following operable units (OUs):

- OU1 – Galena Alternate Water Supply,
- OU2 – Spring River Basin,

- OU3 – Baxter Springs subsite,
- OU4 – Treece subsite,
- OU5 – Galena Groundwater/Surface Water,
- OU6 – Badger, Lawton, Waco, and Crestline subsites,
- OU7 – Galena Residential Soils,
- OU8 – Railroads, and
- OU9 – Tar Creek Watershed.

During the years that the mines operated, railroad spurs were constructed to join conventional large-scale railroads to the individual mining operations. The ballast material used in their beds was often composed of chat from surrounding mine waste piles. Traditionally, these historical railroads were abandoned in place when mining operations ceased, and now the former lines that cross through private property vary in their condition: some show little deterioration from their original condition while others have degraded to the point they are unidentifiable as former rail lines. OU8 comprises the portions of the rail lines within the Cherokee County Superfund Site that have not been or will not be addressed in the remediation of other OUs and that have not been addressed by other means.

During the RI phase of this project, a human health risk assessment (HHRA) and a streamlined ecological risk assessment (ERA) were prepared for OU8 to determine whether contaminant exposure posed unacceptable risks to residents and wildlife. No significant human health risks were identified in the HHRA. The ERA results indicated that site-related contaminants in surface soil, surface water, and sediment may pose a threat to ecological receptors. However, sediment contamination does not appear to be attributable to the rail line. This remedial design addresses soil contamination only.

Remedial Action Objectives

Based on the results of the risk assessments, lead and zinc were identified as contaminants of concern (COCs) posing risk to ecological receptors. To address these risks, the remedial action objectives (RAO)s identified for OU8 for protection of ecological receptors are:

- Prevent exposure of ecological receptors to COCs in source materials that would potentially result in unacceptable ecological risks.
- Prevent exposure of ecological receptors to COCs in soils that would potentially result in unacceptable ecological risks.

Cleanup Levels

Ecological cleanup levels for soil were established as part of the ERA and, at EPA's directive, are being used to determine the extent of materials requiring remediation. Preliminary cleanup levels for site COCs in soil are presented in the following table:

Cleanup Levels for Soil COCs

COCs	Cleanup Level Soil (mg/kg)
Lead	1,770
Zinc	4,000

mg/kg = milligrams per kilogram

Remedial Approach – Source Removal, Waste Consolidation and Capping at OU3/OU4 Consolidation Areas (FS Alternative #3)

Alternative 3 from the feasibility study (FS) (HGL, 2016b) provides protection of ecological receptors through RA involving excavation and removal of waste materials to limit exposure to and mobility of contaminants. All ballast and contaminated soil with concentrations of lead and/or zinc that exceed the cleanup levels would be excavated, the remediated areas backfilled with clean fill and topsoil, and graded to provide positive drainage. Vegetative cover would be established over the backfilled area to restore the property and to provide vegetative root systems to hold the soil in place, preventing erosion and off-site transport by surface runoff or wind. Erosion and sediment controls will be maintained for 1 year while the vegetative cover is being established. For the locations where the former rail bed is used as an access road, the area would be restored to maintain that use.

Excavated soil would be loaded into haul trucks and transported to a central consolidation area (Sunflower Pit waste repository), dumped, graded, and capped.

Project Objective

The overall RA objective for OU8 is the prevention of ecological risks associated with exposure to soils and mine waste containing heavy metals. This preliminary design letter report addresses the former railroad embankments and waste areas within OU8 selected by the EPA for this RD effort.

Nature and Extent of Contamination

The remedial investigation (RI) Report summarized the nature and extent of target analyte list metals contamination in the rail beds in OU8 (HGL, 2016a). The primary source of contamination identified for OU8 is the chat used to construct the rail bed ballasts. The chat originated from mining activities and ore refinement processes that created chat, tailings, and other mine waste material that was transported to OU8.

As a part of the RI, 102 test pits were excavated with a backhoe across the rail ballasts at 34 locations selected to represent varying rail bed conditions, classification, and geographical locations across OU8. An additional 21 test pits were excavated along the railbed alignments in June 2017 and February 2018 to fill data gaps identified during the RI. The excavated material consisted of weathered chat to a depth of about 30 inches where the material generally transitioned to native soil. Soil samples were collected at each test pit location and screened with x-ray fluorescence (XRF) to determine metals concentrations in the subsurface. The RI data

demonstrated that contamination was found to be widespread in both the surface and subsurface railbed materials, but no hotspots were indicated from the data. Metals concentrations generally decreased in the samples of native soil collected beneath the chat if it was encountered above the target depth of 48 inches. The results are discussed in detail in Section 5 of the RI Report (HGL, 2016a) and the Data Gap Sample Results included in Attachment 6 of this report.

In addition to the data gap investigation, an ecological characterization was conducted October 2017. The results are included in Attachment 7.

Delineation of Waste Areas and Volume

The waste subareas addressed by this RD have been grouped into segments based on their geographic location and the continuity of each former railroad spur. The segments are shown on sheets G-03a and G-03b of the construction drawings (Attachment 1). The actual sequence of remediation for the individual areas may be revised during the RA based on funding, property access, and other factors. A summary of proposed RA work to be conducted in each segment is provided below, while physical details, such as length and width, are presented in Attachment 2.

- **Segment A** – This segment is oriented northeast-southwest across pasture, cultivated fields, and wooded areas. It begins at the Missouri state line, passes through the town of Lawton, bisects Highway 69, and ends at the city of Baxter Springs. It is the longest segment and thus was divided into North and South portions in the RD.
- **Segment B** – This segment is in the northern portion of the project area and runs west-east and parallel with Highway 160. It crosses Spring River and runs mostly through cultivated fields and a few pastures.
- **Segment C** –The Jayhawk Chemical Plant is in this segment, which runs south from the intersection of Segments A and B.
- **Segment D** – This segment crosses Spring River and is oriented southwest to northeast through the town of Riverton, then forks into northern and southern portions before entering Galena. There are currently no property access agreements in place for any of the work areas within this segment.
- **Segment E** – This segment runs west-east through pasture and woods on an inside curve of Spring River.
- **Segment F** – This reverse L-shaped segment is in a wooded area east of Baxter Springs and Spring River. There are currently no property access agreements in place for any of the work areas within this segment.
- **Segment H** – There are four small subareas (H1 through H4) located within this segment designation, all located between Sunflower Pit and the city of Baxter Springs. Each borders a cultivated field or pasture land.
- **Segment I** – This segment runs north-south through pastures and cultivated fields at the western limit of the project area.

Previous studies of other OUs in the Cherokee County Superfund Site included interpretation of aerial photographs and field observations (site reconnaissance and excavating test pits), as a means to delineate the approximate horizontal and vertical extent of the mining waste. A similar approach was taken with OU8, with the addition of using cross section information through the former railroad embankments to estimate waste quantities.

The volume of mine waste initially estimated for Alternative 3 in the FS Report was 324,000 cubic yards. That estimate has been refined as part of the RD. An aerial survey was flown in April 2017, and a topographic map of the project area was created from the data using AutoCAD software. The test pit and soil sample locations from the RI were plotted over the survey data along with a centerline and station measurements. XRF screening data and waste thickness from the RI Report (Figures 3.2 through 3.7, and 5.1 through 5.33) were applied to the centerline stationing for each of the OU8 segments, and a spreadsheet was used to estimate the volume of waste and contaminated soil. The revised volume calculated for OU8 using this approach is approximately 810,000 cubic yards, which does not include contingencies or overages. This number also includes no volume from portions of the railbed segments at which property access has not been granted for the future RA. The volume estimate, along with quantities of other construction-related items, are included in Attachment 2.

Construction Costs

The estimated costs associated with the RD are included in Attachment 3. The unit costs were based on the recent cost estimate prepared for the OU4 Northwest Tributary RA construction activities, adjusted for inflation. The assumptions associated with developing the cost estimate are included with the tables in Attachment 3.

Construction Schedule

An RA construction schedule was developed for this preliminary RD submittal and is included in Attachment 4. For estimating purposes, a standard earthwork crew was assumed to include a small to medium-sized excavator, a similar sized dozer, skid loader, ten 18-cubic yard haul trucks, and supporting operators/laborers. A pair of teams would work simultaneously on Segments A and B, while a single team would be enough to work on the remaining smaller segments. It was also assumed that restoration efforts would begin 30 days after initial groundbreaking and follow along after waste removal in segments where earthwork activities are expected to take longer than one month to complete (Segments A, B, and C).

Major work elements for the OU8 RA construction will include general conditions and the remediation efforts in the eight distinct segments. Site preparation will generally consist of implementation of soil erosion and dust control measures, clearing and grubbing, disposal of non-vegetative and vegetative debris, and management of surface water. Remediation will generally consist of excavation of mine waste and former railroad embankment materials, hauling waste off site to the Sunflower Pit waste consolidation area, XRF confirmation sampling, an intermediate topographical survey (to determine waste removal volumes), grading excavated areas and backfilling as necessary to promote positive drainage, and then vegetating all disturbed areas.

Following final grading of excavated areas and vegetating disturbed areas, a final as-built survey will be conducted. Afterward, the RA efforts will be monitored by the RA contractor for a period of 1 year to ensure no significant erosion is occurring and that an acceptable establishment of grass is developing. This warranty period was included in the estimated project schedule.

Project Specifications

Technical specifications for the construction are included in Attachment 5.

References

HydroGeoLogic, Inc. (HGL), 2016a. *Final Remedial Investigation Report, Cherokee County Operable Unit 8 Railroads Site, Cherokee County, Kansas*. March.

HGL, 2016b. *Final Feasibility Study, Cherokee County Operable Unit 8 Railroads Site, Cherokee County, Kansas*. July.

Attachments

Attachment 1 Design Drawings
Attachment 2 Quantity Estimates
Attachment 3 Construction Cost Estimate
Attachment 4 Construction Schedule
Attachment 5 Project Specifications
Attachment 6 Data Gap Sample Results *(Provided on CD)*
Attachment 7 Ecological Characterization *(Provided on CD)*

ATTACHMENT 1
DESIGN DRAWINGS

US EPA
Region 7
Lenexa, Kansas

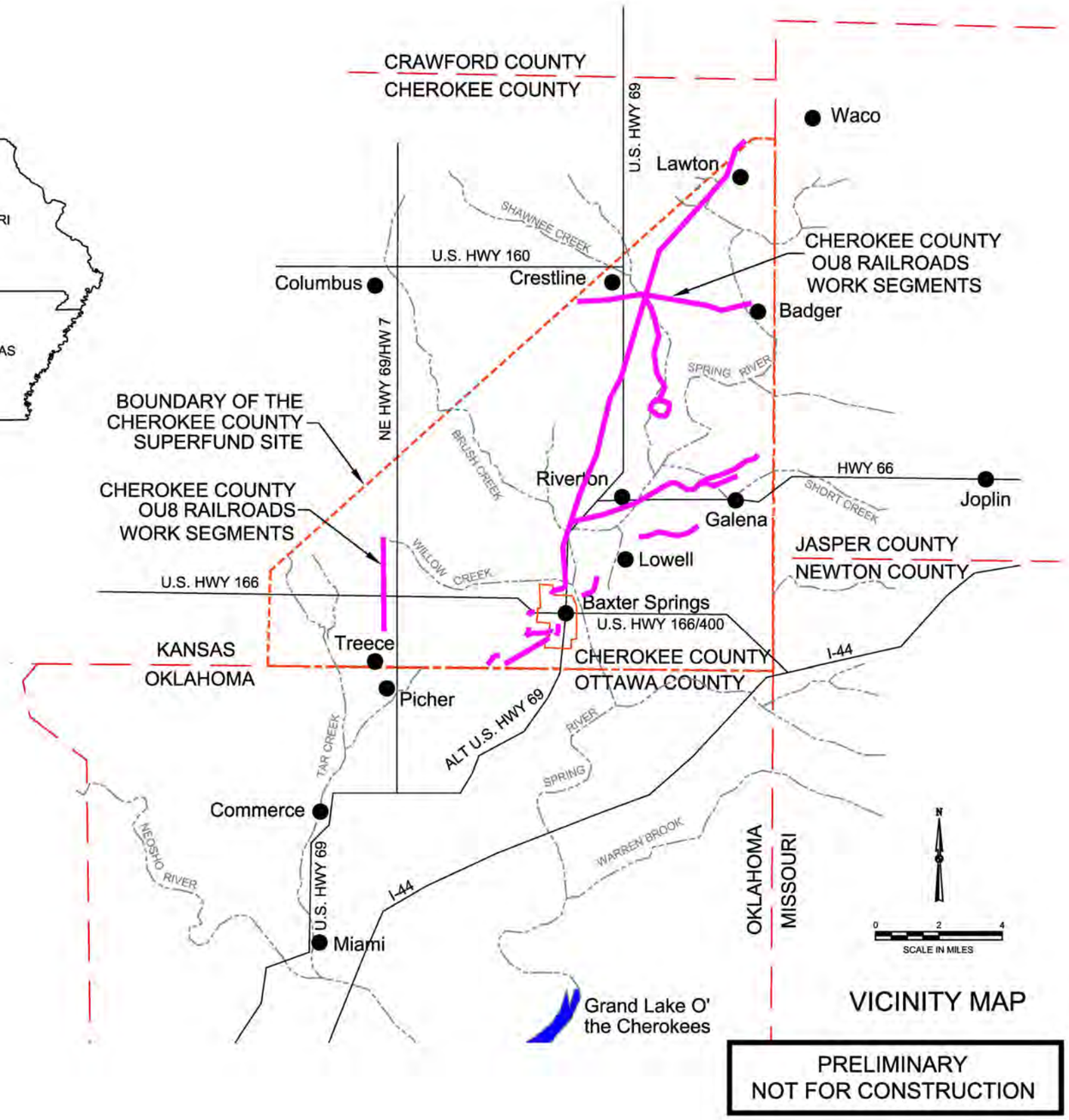
CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
CHEROKEE COUNTY, KANSAS

PRELIMINARY DESIGN SUBMITTAL

October 2018

Prepared By:
HydroGeoLogic, Inc.

INDEX OF DRAWINGS



GENERAL NOTES:

(APPLIES TO ALL SHEETS UNLESS OTHERWISE NOTED)

1. LOCATIONS OF ALL EXISTING STRUCTURES, SUBSURFACE SOIL OR ROCK CONDITIONS ARE BASED ON THE BEST AVAILABLE INFORMATION AND NOT WARRANTED TO BE EXACT, NOR IS IT WARRANTED THAT ALL ARE SHOWN. UTILITIES ARE KNOWN TO BE PRESENT ON THE SITE ALONG PUBLIC ROADS/EASEMENTS AND DEVELOPED PROPERTIES; CONTRACTOR SHALL VERIFY UTILITY LOCATIONS PRIOR TO EXCAVATION.

2. THE CONTRACTOR SHALL BECOME SATISFIED AS TO THE CONDITIONS EXISTING WITHIN EACH AREA, THE TYPE OF EQUIPMENT REQUIRED TO PERFORM THE WORK, AND THE CHARACTER, QUALITY, AND QUANTITY OF THE SUBSURFACE MATERIALS TO BE ENCOUNTERED INSOFAR AS THIS INFORMATION IS REASONABLY ASCERTAINABLE FROM AN INSPECTION OF THE SITE, AS WELL AS INFORMATION PRESENTED BY THE CONTRACT DRAWINGS AND SPECIFICATIONS.

3. THE CONTRACTOR IS RESPONSIBLE FOR LOCATING AND PROTECTING ALL EXISTING SITE IMPROVEMENTS OR STRUCTURES. IT SHALL BE THE CONTRACTOR'S RESPONSIBILITY TO SATISFY THEMSELVES THAT ALL THE EXISTING SITE IMPROVEMENTS, WHETHER SHOWN ON THESE CONTRACT DRAWINGS OR NOT, HAVE BEEN PROPERLY LOCATED.

4. THE CONTRACTOR IS RESPONSIBLE FOR ALL PROJECT SAFETY INCLUDING, BUT NOT LIMITED TO, EXCAVATION, TRAFFIC CONTROL, AND SECURITY.

5. THE U.S. ENVIRONMENTAL PROTECTION AGENCY (EPA) WILL OBTAIN ALL ACCESS AGREEMENTS NECESSARY TO ACCESS THE PROPERTIES THAT REQUIRE REMEDIATION. THE CONTRACTOR IS NOT TO PERFORM WORK ON ANY PROPERTIES WITHOUT AN ACCESS AGREEMENT.

6. THE CONTRACTOR SHALL LIMIT THEIR ACTIVITIES TO WITHIN THE WORK AREAS SHOWN ON THE CONTRACT DRAWINGS. WORK CONDUCTED OUTSIDE OF WORK AREAS, IF REQUIRED, SHALL BE COORDINATED WITH EPA.

7. THE CONTRACTOR SHALL RESTORE ALL DAMAGED AREAS TO THEIR ORIGINAL CONDITION. ALL EXCESS MATERIAL AND SOIL SHALL BECOME THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL BE PREPARED, AS REQUIRED, PRIOR TO USE ON SITE OR DISPOSAL AT AN APPROVED OFF-SITE FACILITY.

8. THE TERM 'ACCEPTABLE' SHALL MEAN WRITTEN ACCEPTANCE TO BE RECEIVED FROM EPA BEFORE WORK IS STARTED.

9. ANY DEVIATIONS FROM THE CONTRACT DRAWINGS OR SPECIFICATIONS MUST BE ACCEPTED BY EPA IN WRITING PRIOR TO THE WORK BEING DONE. ANY DEVIATIONS PERFORMED WITHOUT ACCEPTANCE BY EPA WILL NOT BE PAID FOR, AND MAY BE REQUIRED TO BE REDONE AT THE CONTRACTOR'S EXPENSE.

10. THE CONTRACTOR SHALL HAVE A COPY OF THE CONTRACT DOCUMENTS AT THE WORK SITE AT ALL TIMES.

11. SEE INDIVIDUAL SHEETS FOR ADDITIONAL ABBREVIATIONS, SYMBOLS, LEGENDS, DETAILS, AND NOTES, IF ANY. NOT ALL 'STANDARD' DETAILS SHOWN MAY BE APPLICABLE TO THIS PROJECT.

12. UNLESS NOTED OTHERWISE, ALL WORK SHOWN IN THESE CONTRACT DOCUMENTS IS NEW AND TO BE PERFORMED UNDER THIS CONTRACT.

13. THE CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING SITE SECURITY FOR THEIR FACILITIES AND EQUIPMENT WITHIN THE LIMITS OF THE CONTRACT.

14. THE CONTRACTOR SHALL EXERCISE CAUTION WHEN WORKING AROUND MINE SHAFTS AND SUBSIDENCE PITS, IF ENCOUNTERED. SUBSURFACE VOIDS EXIST IN THE IMMEDIATE AREAS WHERE THE EXCAVATION AND BACKFILLING ACTIVITIES ARE TO BE PERFORMED. THESE VOIDS MAY COLLAPSE OR OPEN AT ANY TIME.

15. THE SIDES OF MINE OPENINGS, SUBSIDENCES, AND FORMER RAILROAD BEDS MAY BE VERY UNSTABLE. EXTREME CAUTION SHOULD BE USED AROUND ALL WORK AREAS. THE CONTRACTING OFFICER'S REPRESENTATIVE WILL STOP WORK IF THE CONTRACTOR IS NOT FOLLOWING GENERAL SAFETY PRACTICES. THE CONTRACTOR IS SOLELY RESPONSIBLE FOR WORKING SAFELY AT ALL AREAS OF THE SITE.

16. EXCAVATION AND BACKFILL ACTIVITIES SHALL BE PERFORMED IN ACCORDANCE WITH THE REQUIREMENTS OF THE PERFORMANCE WORK STATEMENT AND THE CONTRACTOR'S APPROVED SITE HEALTH AND SAFETY PLAN. APPROPRIATE HEALTH AND SAFETY MEASURES AND TRAINING WILL BE REQUIRED AT ALL WORK LOCATIONS.

17. THE TERM 'MINE WASTE' SHALL MEAN CHAT, TAILINGS, RAILROAD EMBANKMENT MATERIALS, AND CONTAMINATED SOIL WITH METALS CONCENTRATIONS EXCEEDING CLEANUP GOALS SPECIFIED IN THE PERFORMANCE WORK STATEMENT.

18. COORDINATES USED ON CONTRACT DRAWINGS ARE NAD83 (CORS 96) KANSAS STATE PLANE, ZONE 1502 KANSAS SOUTH IN US SURVEY FEET. VERTICAL DATUM IS MEAN SEA LEVEL NAVD 1988 (TABLE 1).

19. SITE TOPOGRAPHIC SURVEY AND AERIAL PHOTOGRAPHY PERFORMED IN MARCH AND APRIL 2017. THE FLIGHT HEIGHT OF THE AERIAL PHOTOGRAPHY WAS 2,000 FEET ABOVE MEAN TERRAIN ELEVATION. PERMANENT BENCH MARKS OR REFERENCE POINTS ESTABLISHED FOR THE SURVEYS ARE LISTED IN TABLE 1 ON THIS SHEET.

SITE AND EXCAVATION PLAN NOTES:

(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. CLEARING AND GRUBBING SHALL BE CONDUCTED AS SPECIFIED IN SECTION 02230 WITHIN THE LIMITS OF CONSTRUCTION. TREE AND PLANT PROTECTION DURING CLEARING AND GRUBBING SHALL BE CONDUCTED IN ACCORDANCE WITH SECTION 02230.

2. VEGETATIVE DEBRIS FROM CLEARING AND GRUBBING SHALL BE DISPOSED IN ACCORDANCE WITH SECTION 02230. OPEN BURNING SHALL BE CONDUCTED IN ACCORDANCE WITH SECTION 02121. DISPOSE OF MISCELLANEOUS DEBRIS OFF SITE IN ACCORDANCE WITH SPECIFICATION 02121.

3. INITIAL CONSTRUCTION LIMITS SHOWN ON THE DRAWINGS ARE FOR ESTIMATING PURPOSES ONLY. THE CONSTRUCTION LIMITS MAY BE MODIFIED BY EPA IF WASTE MATERIALS OR CONTAMINATED SOIL IS FOUND BEYOND THE INITIAL LIMITS.

4. EXCAVATE MINE WASTE AND CONTAMINATED SOIL IN ACCORDANCE WITH SECTION 02111. EXCAVATED MATERIALS SHALL BE DISPOSED OF AT THE EXISTING SUNFLOWER PIT WASTE CONSOLIDATION AREA LOCATED AT THE NE CORNER OF THE INTERSECTION OF SE 30TH STREET AND STATE LINE ROAD. SEE SHEET G-04 FOR DIRECTIONS TO THAT AREA AND INSTRUCTIONS REGARDING MATERIAL HANDLING AND PLACEMENT AT THIS DISPOSAL AREA.

5. CONFIRMATION SAMPLING AND/OR XRF SCREENING SHALL BE CONDUCTED AND DOCUMENTED BY THE CONTRACTOR IN ACCORDANCE WITH SECTION 02111.

6. FOR PURPOSES OF BIDDING, REFER TO TABLE 2 ON THIS SHEET FOR ESTIMATED WASTE AND CONTAMINATED SOIL VOLUMES. THE DEPTH OF EXCAVATION SHALL BE BASED ON CONFIRMATION SAMPLING IN ACCORDANCE WITH SECTION 02111.

7. EXCAVATE AROUND TREES AND BUSHES TO BE LEFT IN PLACE UNLESS OTHERWISE SPECIFIED IN ACCORDANCE WITH SECTIONS 01490 AND 02111. THE EXCLUSION RADII FOR TREES AND BUSHES LEFT IN PLACE ARE SPECIFIED IN SECTION 02111.

8. EXISTING STRUCTURES, INCLUDING CONCRETE MILL WORKS STRUCTURES OR FORMER BRIDGE PILINGS, SHALL NOT BE REMOVED UNLESS SPECIFICALLY INDICATED ON THE DRAWINGS.

9. IMPLEMENT AND MAINTAIN SEDIMENT AND EROSION CONTROL MEASURES IN ACCORDANCE WITH SECTION 02910. MAINTAIN EXISTING DRAINAGE PATTERNS DURING CONSTRUCTION. THE FINAL EXCAVATION SURFACE SHALL BE GRADED IN ACCORDANCE WITH SECTION 02111.

10. RESTORATION ACTIVITIES, INCLUDING BACKFILLING, SHALL NOT COMMENCE WITHOUT APPROVAL BY EPA.

11. OVEREXCAVATION OF UNIMPACTED SOIL WITHIN THE INDIVIDUAL WASTE AREAS TO GENERATE COVER MATERIALS WITHOUT EPA PERMISSION IS STRICTLY PROHIBITED EXCEPT FOR AREAS NOTED ON THE DRAWINGS.

TABLE 2 - ESTIMATED VOLUME OF WASTE AND CONTAMINATED SOIL TO BE EXCAVATED AND PLACED IN MINE WASTE CONSOLIDATION AREAS

REMEDIATION AREA	LENGTH (FT)	LENGTH (MI)	WASTE VOL (BCY)
SEGMENT A	88,650	16.79	535,500
SEGMENT B	29,800	5.64	292,800
SEGMENT C	18,350	3.47	113,400
SEGMENT D	41,600	7.88	NO ACCESS
SEGMENT E	10,600	2.01	17,600
SEGMENT F	4,000	0.76	NO ACCESS
SEGMENT H1/2/3/4	18,100	3.42	34,700
SEGMENT I	16,050	3.04	16,900
ESTIMATED TOTAL	227,050	43.00	808,700

NOTES:

1. FT = FEET MI = MILE BCY = BANK CUBIC YARD AC = ACRE
2. FOR PURPOSES OF BIDDING, THE VALUES LISTED IN THIS TABLE SHALL BE USED TO ESTIMATE THE AREA REQUIRING SITE RESTORATION, INCLUDING GRADING, SEEDING, AND REVEGETATION. THESE VALUES DESCRIBE ONLY THE AREA OVER WHICH MINE WASTE IS VISIBLE AT THE GROUND SURFACE AND/OR TEST PITS HAVE BEEN EXCAVATED. REFER TO TABLE 3 FOR ESTIMATED VOLUMES OF BACKFILL AND TOPSOIL.
3. FOR BIDDING PURPOSES, THE ESTIMATED VOLUMES LISTED IN TABLE 2 REPRESENT THE APPROXIMATE AMOUNT OF MINE WASTE AND CONTAMINATED SOIL REQUIRING DISPOSAL IN CONSOLIDATION AREAS. A 25 PERCENT OVERAGE WAS ADDED TO ALLOW FOR IRREGULARITIES AND OTHER UNKNOWNS.
4. THE LENGTHS LISTED HERE INCLUDE PROPERTIES WITHOUT AN ACCESS AGREEMENT WITH THE CURRENT OWNER, AND/OR PROPERTIES WHERE THE FORMER RAIL LINE HAS ALREADY BEEN REMOVED. TOTAL LENGTH OF PROPERTIES WITH CURRENT ACCESS AGREEMENTS IS 119,500 FEET (22.6 MILES).

GRADING AND RESTORATION PLAN NOTES:

(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. RESTORATION SHALL START ONLY AFTER EXCAVATION ACTIVITIES ARE COMPLETED AS SPECIFIED IN SECTION 02111.

2. THE CONTRACTOR SHALL MAINTAIN ANY AND ALL EROSION AND SEDIMENTATION CONTROLS PREVIOUSLY INSTALLED AS SPECIFIED IN SECTION 02910 DURING RESTORATION ACTIVITIES.

3. THE GRADING AND RESTORATION REQUIREMENTS SHOWN ON THE DRAWINGS ARE CONCEPTUAL AND MAY BE ADJUSTED OR MODIFIED BASED ON SITE CONDITIONS FOLLOWING COMPLETION OF MINE WASTE EXCAVATION. ANY CHANGES PROPOSED BY THE CONTRACTOR SHALL BE SUBMITTED IN WRITING TO EPA FOR REVIEW AND APPROVAL. RESTORATION ACTIVITIES SHALL NOT COMMENCE WITHOUT APPROVAL BY EPA.

4. COMPLETION OF SITE RESTORATION ACTIVITIES SHALL CONFORM TO SECTION 02300 AND THE FOLLOWING CRITERIA, EXCEPT WHERE INDICATED OTHERWISE ON THE DRAWINGS:
   - THE EXCAVATED AREAS SHALL BE BACKFILLED WITH CLEAN SILTY CLAY BACKFILL AND COVERED WITH SIX INCHES OF IMPORTED ORGANIC TOPSOIL TO MATCH ADJACENT TOPOGRAPHY. BORROW SOURCES SHALL BE APPROVED BY EPA PRIOR TO SITE RESTORATION. REFER TO SECTION 02140 FOR ADDITIONAL INFORMATION.
   - THE EXCAVATED AREAS SHALL BE BACKFILLED AND GRADED AS NECESSARY TO PROVIDE POSITIVE SURFACE DRAINAGE WITH CROSS SLOPES OF 1 TO 3 PERCENT TO MATCH THE SURROUNDING GRADE, AND/OR AS DESCRIBED ON THE DRAWINGS.
   - REFER TO TABLE 3 FOR ESTIMATED VOLUME OF IMPORTED SUBGRADE BACKFILL AND TOPSOIL REQUIRED FOR SITE RESTORATION.
   - AT THE END OF THE REMEDIAL ACTIVITIES, THE DISPOSAL AREA AT SUNFLOWER PIT USED BY THE CONTRACTOR SHALL BE GRADED TO PREVENT WASTE AND SEDIMENT FROM LEAVING THE SITE DURING PRECIPITATION EVENTS.

5. THE CONTRACTOR SHALL RESTORE ALL DISTURBED AREAS ADJACENT TO THE WORK AREAS AS PART OF THEIR RESTORATION ACTIVITIES, INCLUDING RESTORATION OF PRECONSTRUCTION DRAINAGE CONDITIONS.

6. RESTORATION AROUND TREES AND BUSHES TO BE LEFT IN PLACE SHALL BE SUBJECT TO THE EXCLUSION RADIUS RESTRICTIONS THAT ARE SPECIFIED IN SECTION 02111.

7. SEEDING AND MULCHING SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS AND IN ACCORDANCE WITH SECTION 02921.

8. VARIOUS SITE AREAS AND PROPERTIES CONTAIN FENCING FOR SECURITY AND/OR LIVESTOCK CONTROL. THE CONTRACTOR SHALL MAINTAIN SITE SECURITY. WHERE IT IS NECESSARY TO REMOVE EXISTING GATES AND FENCING TO ACCESS THE WORK AREAS, THE CONTRACTOR SHALL PROVIDE TEMPORARY FENCING AS NEEDED FOR LIVESTOCK CONTROL. AS PART OF SITE RESTORATION, THE CONTRACTOR SHALL REPLACE THE RELOCATED FENCING IN ITS ORIGINAL LOCATION AND CONDITION. ANY MATERIALS DAMAGED BY THE CONTRACTOR SHALL BE REPLACED WITH NEW, LIKE MATERIALS AT NO COST TO EPA.

SOIL EROSION AND SEDIMENT CONTROL NOTES:

(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. THE CONTRACTOR SHALL INSTALL THE APPROPRIATE EROSION AND SEDIMENT CONTROLS PRIOR TO COMMENCING CONSTRUCTION ACTIVITIES. THE EROSION CONTROL PRACTICES AND STRUCTURES SHALL BE APPROVED PRIOR TO IMPLEMENTATION IN ACCORDANCE WITH SECTION 02910. EROSION AND SEDIMENT CONTROLS SHALL BE MAINTAINED IN ACCORDANCE WITH SECTION 02910 DURING CONSTRUCTION.

2. THE CONTRACTOR SHALL BE RESPONSIBLE FOR INSTALLING ANY AND ALL TEMPORARY OR PERMANENT SOIL EROSION AND SEDIMENT CONTROL MEASURES DEEMED NECESSARY DURING THE COURSE OF CONSTRUCTION AT THE WORK SEGMENTS LISTED IN TABLE 2 AS WELL AS AT THE SUNFLOWER PIT WASTE CONSOLIDATION AREA.

3. SILT FENCING, STRAW BALES, TEMPORARY DIVERSION DITCHES, AND DRAINAGE SWALES SHOWN ON THE CONTRACT DRAWINGS SHALL BE CONSTRUCTED AS SHOWN ON SHEET CD-01 AND CD-02 AND AS SPECIFIED IN SECTION 02910.

4. TEMPORARY PROJECT SAFETY FENCING SHALL BE CONSTRUCTED AROUND WORK AREA(S) AS DIRECTED BY EPA AND AS SPECIFIED IN THE PERFORMANCE WORK STATEMENT.

5. EROSION AND SEDIMENT CONTROLS SHALL BE REMOVED UPON ACCEPTANCE OF VEGETATION AS SPECIFIED IN SECTION 02921.

TABLE 1 - SURVEY REFERENCE POINTS

POINT	NORTHING	EASTING	ELEV.	CODE
19	1,457,033.08	2,378,009.30	837.78	AT19
7001	1,460,731.38	2,379,178.81	850.09	AT7001
7002	1,466,027.45	2,379,077.39	866.90	AT7002
7003	1,476,647.87	2,378,636.13	888.56	AT7003
7004	1,456,433.67	2,399,335.40	861.02	AT7004
7005	1,454,857.33	2,397,335.79	843.34	AT7005
7006	1,454,968.54	2,400,363.53	850.68	AT7006
7007	1,457,716.08	2,405,145.12	847.64	AT7007
7008	1,460,103.14	2,404,526.05	849.25	AT7008
7009	1,461,180.81	2,404,413.13	842.88	AT7009
7010	1,463,303.40	2,404,359.75	838.53	AT7010
7011	1,466,866.60	2,413,659.28	799.79	AT7011
7012	1,471,354.78	2,417,377.74	805.08	AT7012
7013	1,468,007.98	2,410,200.29	833.40	AT7013
7014	1,467,136.12	2,408,523.08	828.15	AT7014
7015	1,476,088.96	2,410,812.69	823.59	AT7015
7016	1,483,372.54	2,412,903.52	825.00	AT7016
7017	1,494,230.24	2,416,970.47	852.84	AT7017
7018	1,501,846.02	2,418,666.79	845.96	AT7018
7019	1,510,440.37	2,422,259.79	868.22	AT7019
7020	1,518,305.09	2,417,984.77	869.36	AT7020
7021	1,519,171.43	2,423,266.36	853.13	AT7021
7022	1,526,738.44	2,427,170.13	881.25	AT7022
7023	1,537,874.72	2,437,299.48	881.20	AT7023
7024	1,547,229.22	2,442,066.20	887.03	AT7024
7025	1,517,751.83	2,443,151.16	846.65	AT7025
7026	1,510,622.54	2,426,773.77	851.70	AT7026
7027	1,517,567.22	2,434,031.52	888.45	AT7027
7028	1,500,862.30	2,426,769.18	855.10	AT7028
7029	1,494,477.82	2,425,332.86	826.12	AT7029
7030	1,488,752.91	2,415,156.80	849.05	AT7030
7031	1,477,054.07	2,423,671.40	831.06	AT7031
7032	1,478,764.66	2,433,820.85	900.67	AT7032
7033	1,477,204.51	2,430,406.10	930.81	AT7033
7034	1,491,220.98	2,444,361.69	925.37	AT7034
7035	1,488,050.23	2,438,274.13	888.26	AT7035
7036	1,483,778.42	2,424,482.22	817.51	AT7036
7037	1,479,981.84	2,413,148.80	811.60	AT7037
7038	1,480,703.93	2,416,380.38	815.80	AT7038
7039	1,515,949.72	2,426,186.54	853.76	AT7039
7040	1,518,516.97	2,428,622.71	863.30	AT7040
7041	1,485,797.60	2,431,226.68	855.80	AT7041
7042	1,460,325.00	2,409,470.95	838.55	AT7042
7043	1,461,772.66	2,409,610.35	833.70	AT7043
7044	1,467,498.50	2,417,553.59	807.58	AT7044
7045	1,486,712.29	2,429,853.11	840.25	AT7045
7046	1,498,617.59	2,428,566.30	846.53	AT7046
7047	1,516,111.79	2,412,715.52	886.51	AT7047
7124	1,547,294.85	2,443,057.85	893.52	AT7124
7500	1,523,332.11	2,443,054.11	917.39	CARL

HORIZONTAL DATUM: NAD83(2011) KS STATE PLANE COORDINATE SYSTEM
VERTICAL DATUM: NAVD 1988 ADJUSTMENT
ZONE: KANSAS SOUTH

NOTE: A HORIZONTAL CORRECTION FACTOR OF 1.000024970 MAY BE APPLIED TO CONVERT STANDARD SURVEY COORDINATES TO THE KANSAS STATE PLANE SYSTEM.

TABLE 3 - ESTIMATED VOLUME OF IMPORTED SUBGRADE BACKFILL AND TOPSOIL TO BE PLACED DURING SITE RESTORATION

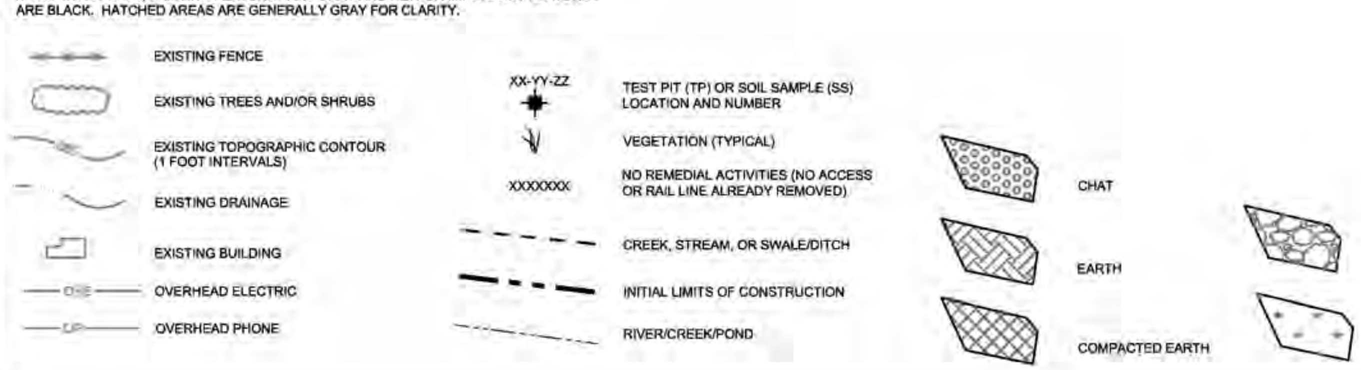
	EXCAVATED AREAS	
REMEDIATION AREA	SELECT FILL	TOPSOIL
SEGMENT A	85,700	15,800
SEGMENT B	46,900	5,100
SEGMENT C	18,100	3,000
SEGMENT D	NO ACCESS	–
SEGMENT E	2,800	400
SEGMENT F	NO ACCESS	–
SEGMENT H1/2/3/4	5,600	2,800
SEGMENT I	2,700	600
ESTIMATED TOTAL	161,700	27,700

NOTES:

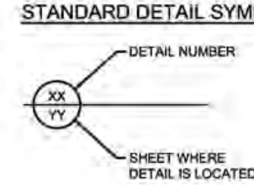
1. ALL FILL VOLUMES ARE PRESENTED AS CUBIC YARDS, AND CONTAIN NO OVERAGES.
2. ESTIMATED VOLUMES LISTED FOR EXCAVATED AREAS ASSUME A MINIMUM OF 6" OF SUBGRADE BACKFILL AND 6" OF TOPSOIL PLACED ACROSS THE REMEDIATION AREA AT EACH WORK SITE. ADDITIONAL SUBGRADE MATERIAL MAY BE REQUIRED TO GRADE AND SHAPE THE DISTURBED AREAS IN ORDER TO MAINTAIN POSITIVE DRAINAGE ACROSS EACH SITE.

LEGEND

NOTE: IN GENERAL, EXISTING FEATURES ARE GRAY AND NEW OR IMPORTANT FEATURES ARE BLACK. HATCHED AREAS ARE GENERALLY GRAY FOR CLARITY.



STANDARD DETAIL SYMBOL



* ALL SYMBOLS AND ABBREVIATIONS ON THIS SHEET ARE FOR GENERAL INFORMATION AND MAY NOT NECESSARILY BE USED ON EVERY SHEET WITHIN THESE CONTRACT DOCUMENTS.

PRELIMINARY
NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK | DESCRIPTION | DATE | APPR

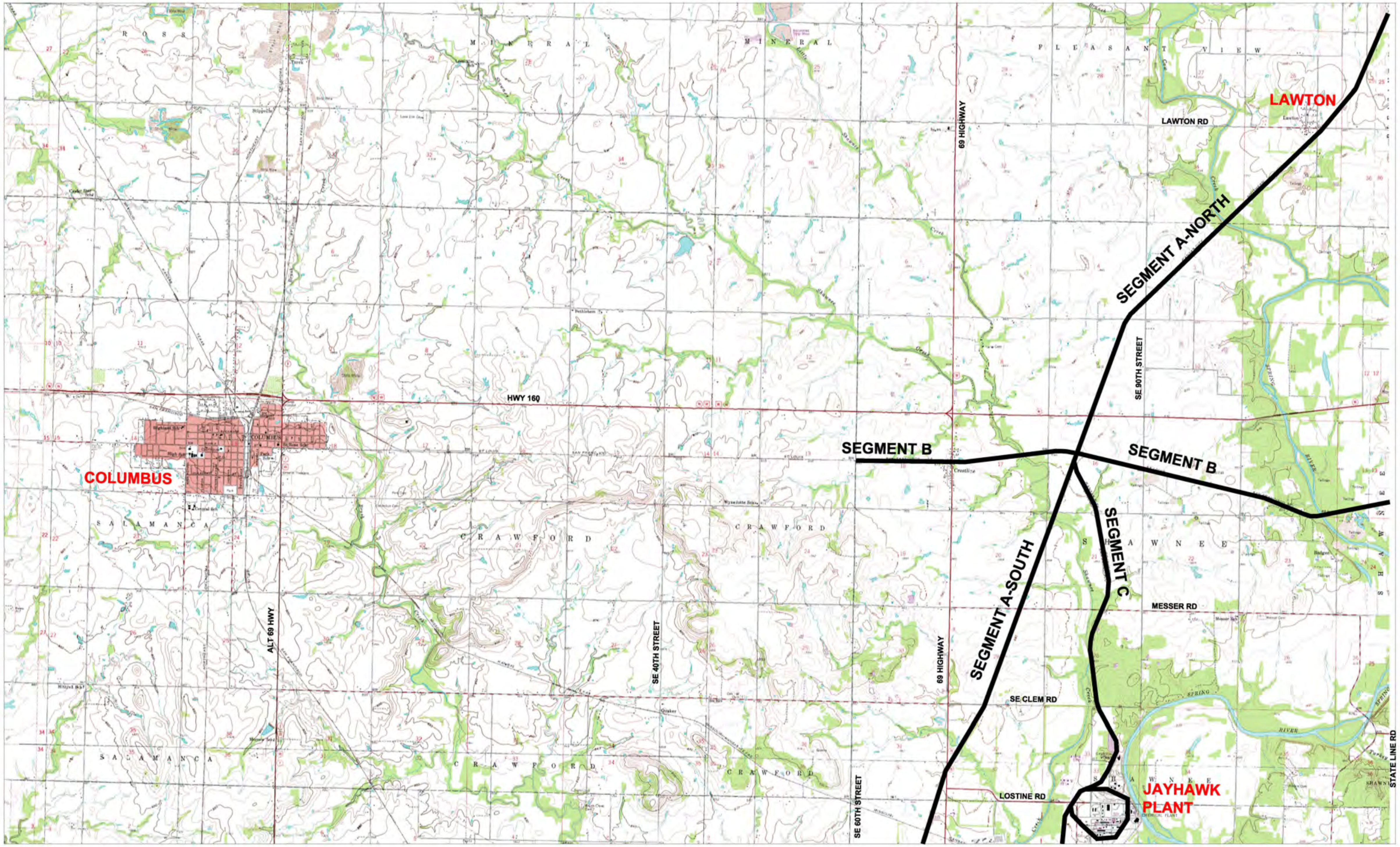
HGL

DESIGNED BY: C.FERGUSON
DWN BY: C.FERGUSON
CKD BY: A.FLETCHER
SUBMITTED BY: HGL
PLOT SCALE: 1"=1'
PLOT DATE: 03/08/2019
SIZE: ANSI D
FILE NAME: (G-02)Gen_Notes_Legend.dwg
DATE: OCTOBER 2018
SOLICITATION NO.:
CONTRACT NO.: EP-S7-05-06 TO-0073
FILE NUMBER: EP8073

CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS

GENERAL NOTES AND LEGEND

SHEET IDENTIFICATION
G-02



NOTES:

(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. MAKE IMPROVEMENTS TO HAUL ROADS, AS NECESSARY, TO ACCOMMODATE CONSTRUCTION EQUIPMENT. TEMPORARY HAUL ROADS MAY BE WIDENED TO PERMIT TWO-WAY TRAFFIC AS REQUIRED.

2. TRANSPORT MINE WASTE AND IMPORT MATERIAL IN ACCORDANCE WITH SECTION 02121. THE CONTRACTOR SHALL MAINTAIN HAUL ROADS IN ACCORDANCE WITH SECTION 02121.

3. TEMPORARY ACCESS AND HAUL ROADS SHALL BE MAINTAINED IN ACCORDANCE WITH SECTION 02121. TEMPORARY ACCESS AND HAUL ROADS SHALL BE REMOVED UPON COMPLETION OF WORK IN THAT AREA UNLESS THE LANDOWNER REQUESTS IN WRITING THAT THEY REMAIN IN PLACE. IF SUCH A REQUEST IS MADE, EPA MUST RECEIVE A COPY OF THE REQUEST. REMOVAL OF TEMPORARY ACCESS AND HAUL ROADS SHALL INCLUDE REMOVAL AND PROPER DISPOSAL OF ANY MINE WASTE AND IMPACTED SOIL AND REPLACEMENT WITH CLEAN FILL APPROVED BY EPA. DISTURBED AREAS SHALL BE GRADED TO MATCH SURROUNDING AREAS AND SEEDED IN ACCORDANCE WITH SECTION 02921.

4. THE SOURCE OF THE TOPOGRAPHIC IMAGES IS UNITED STATES GEOLOGICAL SURVEY, 2015.

N

1" = 3,000'
1,500 0 3,000

NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

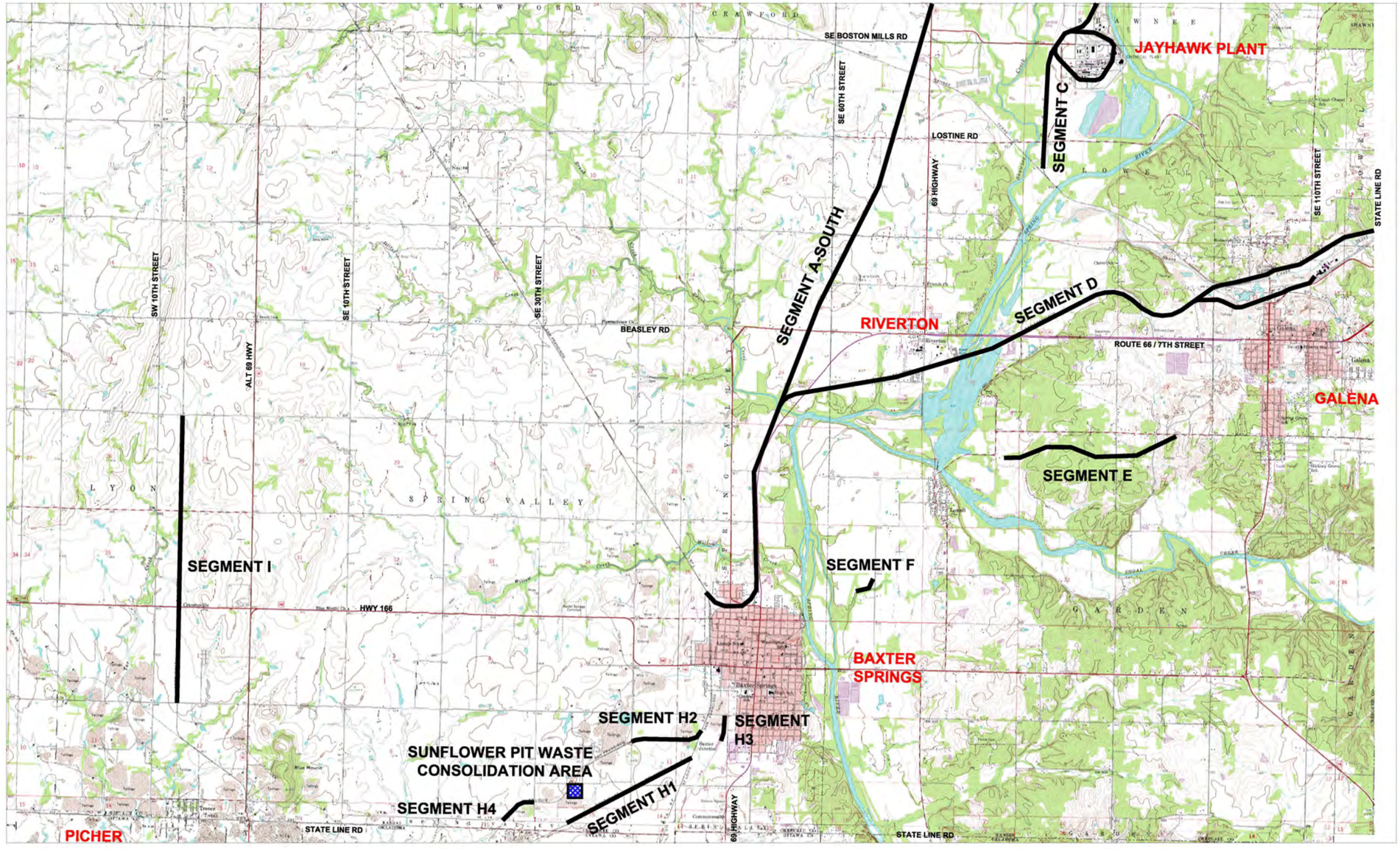
DESIGNED BY: C.FERGUSON		DATE: OCTOBER 2018
DWN BY: C.FERGUSON	CKD BY: A.FLETCHER	SOLICITATION NO.:
SUBMITTED BY: HGL		CONTRACT NO.: EP-S7-05-05 TO-0073
PLOT SCALE: 1"=1000'	PLOT DATE: 10/25/2018	FILE NUMBER: EP8073
SIZE: ANSI D	FILE NAME: (G-03)Gen_Site_Plan.dwg	

HGL HydroGeoLogic, Inc.

CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS

GENERAL SITE PLAN

SHEET IDENTIFICATION
G-03a



NOTES:

(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. MAKE IMPROVEMENTS TO HAUL ROADS, AS NECESSARY, TO ACCOMMODATE CONSTRUCTION EQUIPMENT. TEMPORARY HAUL ROADS MAY BE WIDENED TO PERMIT TWO-WAY TRAFFIC AS REQUIRED.

2. TRANSPORT MINE WASTE AND IMPORT MATERIAL IN ACCORDANCE WITH SECTION 02121. THE CONTRACTOR SHALL MAINTAIN HAUL ROADS IN ACCORDANCE WITH SECTION 02121.

3. TEMPORARY ACCESS AND HAUL ROADS SHALL BE MAINTAINED IN ACCORDANCE WITH SECTION 02121. TEMPORARY ACCESS AND HAUL ROADS SHALL BE REMOVED UPON COMPLETION OF WORK IN THAT AREA UNLESS THE LANDOWNER REQUESTS IN WRITING THAT THEY REMAIN IN PLACE. IF SUCH A REQUEST IS MADE, EPA MUST RECEIVE A COPY OF THE REQUEST. REMOVAL OF TEMPORARY ACCESS AND HAUL ROADS SHALL INCLUDE REMOVAL AND PROPER DISPOSAL OF ANY MINE WASTE AND IMPACTED SOIL AND REPLACEMENT WITH CLEAN FILL APPROVED BY EPA. DISTURBED AREAS SHALL BE GRADED TO MATCH SURROUNDING AREAS AND SEEDED IN ACCORDANCE WITH SECTION 02921.

4. THE SOURCE OF THE TOPOGRAPHIC IMAGES IS UNITED STATES GEOLOGICAL SURVEY, 2015.

N

1" = 3,000'

1,500 0 3,000

NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	APPR	DATE
MARK	DESCRIPTION	APPR	DATE

DESIGNED BY: C. FERGUSON
DWN BY: C. FERGUSON
CHD BY: A. FLETCHER
SUBMITTED BY: HGL
PLOT SCALE: 1:3000
SIZE: ANSI D
DATE: OCTOBER 2018
SOLICITATION NO.:
CONTRACT NO.: EP-S7-05-05 TO-0073
FILE NUMBER: EP3013
PLOT DATE: 10/5/2018
FILE NAME: (G-03)Gen_Site_Plan.dwg

HGL
HYDROGEOLOGIC, INC.

CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS

GENERAL SITE PLAN

SHEET IDENTIFICATION
G-03b

SITE NOTES:

(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. EXCAVATED MATERIALS GENERATED DURING THE REMEDIAL ACTIVITIES AT THE FORMER RAILROAD EMBANKMENT SEGMENTS SHALL BE DISPOSED OF AT THE SUNFLOWER PIT WASTE CONSOLIDATION AREA SHOWN ON THIS SHEET.

2. CONSTRUCTION LIMITS SHOWN ON THE DRAWINGS ARE FOR ESTIMATING PURPOSES ONLY. THE CONSTRUCTION LIMITS MAY BE MODIFIED BY EPA IF ADDITIONAL WORK SPACE IS NEEDED.

3. THE SUNFLOWER PIT IS A FORMER MINE SHAFT THAT HAS BEEN PARTIALLY BACKFILLED DURING OTHER MINE WASTE REMEDIATION PROJECTS IN THIS REGION. WASTE MATERIALS GENERATED FROM THE OU-8 RAILROAD EMBANKMENT REMEDIAL ACTIVITIES SHALL BE TRANSPORTED FROM THE INDIVIDUAL SEGMENT WORK AREAS AND DISPOSED OF IN THE SUNFLOWER PIT.

4. IMPLEMENT AND MAINTAIN SEDIMENT AND EROSION CONTROL MEASURES IN ACCORDANCE WITH SECTION 02910. MAINTAIN EXISTING DRAINAGE PATTERNS DURING CONSTRUCTION.

5. AERIAL IMAGERY SOURCE: GOOGLE EARTH, MARCH 2015.

GRADING AND RESTORATION NOTES:

(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. THE CONTRACTOR SHALL MAINTAIN ANY AND ALL EROSION AND SEDIMENTATION CONTROLS PREVIOUSLY INSTALLED AS SPECIFIED IN SECTION 02910. THE EROSION CONTROL PRACTICES AND STRUCTURES SHALL BE APPROVED PRIOR TO IMPLEMENTATION IN ACCORDANCE WITH SECTION 02910, AND SHALL BE MAINTAINED DURING CONSTRUCTION.

2. THE GRADING AND RESTORATION REQUIREMENTS SHOWN ON THE DRAWINGS ARE CONCEPTUAL AND MAY BE ADJUSTED OR MODIFIED BASED ON SITE CONDITIONS. ANY CHANGES PROPOSED BY THE CONTRACTOR SHALL BE SUBMITTED IN WRITING TO EPA FOR REVIEW AND APPROVAL.

3. COMPLETION OF SITE BACKFILLING, GRADING, AND RESTORATION ACTIVITIES SHALL CONFORM TO THE SPECIFICATIONS AND THE FOLLOWING CRITERIA, EXCEPT WHERE INDICATED OTHERWISE ON THE DRAWINGS:
   - MINING WASTE, CONTAMINATED SOIL, AND FORMER RAILROAD EMBANKMENT MATERIALS GENERATED DURING THE OU-8 REMEDIAL ACTIVITIES SHALL BE TRANSPORTED TO THE WASTE CONSOLIDATION AREA, DUMPED IN THE SPECIFIED ZONE, AND PUSHED INTO SUNFLOWER PIT.
   - THE CONTRACTOR SHALL BE RESPONSIBLE FOR GRADING AND EROSION CONTROL MEASURES WITHIN THE DISPOSAL AND GRADING AREA DISTURBED BY THEM AS PART OF THE OU-8 ACTIVITIES. AREAS LOCATED IN THE REMAINDER OF THIS SITE'S QUARTER SECTION BUT OUTSIDE THE OU-8 DISPOSAL FOOTPRINT WILL BE COVERED UNDER SEPARATE CONTRACTS.
   - AT THE END OF THE OU8 REMEDIAL ACTIVITIES, THE DISPOSAL AREA AT SUNFLOWER PIT USED BY THE CONTRACTOR SHALL BE GRADED TO PREVENT WASTE AND SEDIMENT FROM LEAVING THE SITE DURING PRECIPITATION EVENTS AND TO PROVIDE POSITIVE SURFACE DRAINAGE TOWARD THE WATER SURFACE OF THE PIT WITH CROSS SLOPES OF 1 TO 3 PERCENT AND TO MATCH THE SURROUNDING GRADE.
   - RESTORATION ACTIVITIES SHALL NOT COMMENCE WITHOUT APPROVAL BY EPA.

4. THE CONTRACTOR SHALL BE RESPONSIBLE FOR RESTORING AREAS OUTSIDE THE WASTE DUMPING ZONE WHICH BECOME DISTURBED AS A RESULT OF THEIR HAULING AND DISPOSAL ACTIVITIES. SEEDING AND MULCHING OF THESE AREAS SHALL BE AS SPECIFIED IN THE CONTRACT DOCUMENTS AND IN ACCORDANCE WITH SECTION 02921.

5. VARIOUS AREAS AND PROPERTIES CONTAIN FENCING FOR SECURITY AND/OR LIVESTOCK CONTROL. THE CONTRACTOR SHALL MAINTAIN SITE SECURITY. WHERE IT IS NECESSARY TO REMOVE EXISTING GATES AND FENCING TO ACCESS THE WORK AREAS, THE CONTRACTOR SHALL PROVIDE TEMPORARY FENCING AS NEEDED FOR LIVESTOCK CONTROL AND SITE SECURITY. AS PART OF SITE RESTORATION, THE CONTRACTOR SHALL REPLACE ANY FENCING THEY RELOCATED TO ITS ORIGINAL LOCATION AND CONDITION. ANY MATERIALS DAMAGED BY THE CONTRACTOR SHALL BE REPLACED WITH NEW, LIKE MATERIALS AT NO COST TO EPA.

N

1" = 200'

100 0 200

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

DESIGNED BY: D. ERICKSON
DWN BY: C. FERGUSON
CKD BY: A. FLETCHER
SUBMITTED BY: HGL
PLOT SCALE: 1=200'
STATE: KANSAS
DATE: OCTOBER 2018
SOLICITATION NO.:
CONTRACT NO.: EP-S7-05-05 TO-0073
PLOT DATE:
FILE NUMBER: EP3073
FILE NAME:

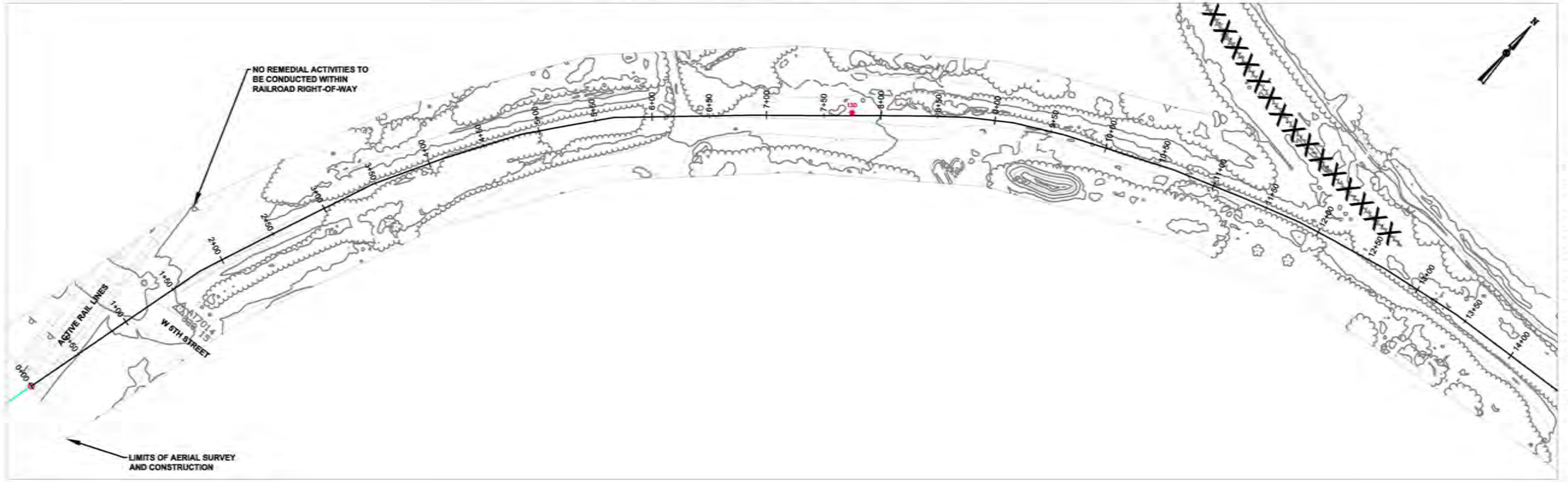
HGL

CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS

LAYOUT OF SUNFLOWER PIT
WASTE CONSOLIDATION AREA

SHEET IDENTIFICATION
G-04

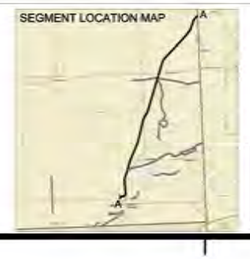
SEGMENT A (SOUTH PORTION) - STA 0+00 to 27+50



SEGMENT A SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

[these notes will be updated for the final version of drawings]

SEGMENT LOCATION MAP



1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

DESIGNED BY: C. FERGUSON
DRN BY: T. BRASWELL
CHD BY: A. FLETCHER
SUBMITTED BY: HGL
PLOT SCALE: 1"=50'
PLOT DATE:
DATE: OCTOBER 2018
SOLICITATION NO.:
CONTRACT NO.: EP-S7-05-05 TO-0013
FILE NUMBER: EP0013
FILE NAME: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RR\AutoCAD\Align_Aa\All_Sites.dwg (Align_Aa)(All_Sites.dwg)

HGL

CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS

EXCAVATION AND RESTORATION PLAN
SEGMENT A, STA 0+00 to 27+50

SHEET IDENTIFICATION
C-Aa

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RR\AutoCAD\Align_Aa\All_Sites.dwg
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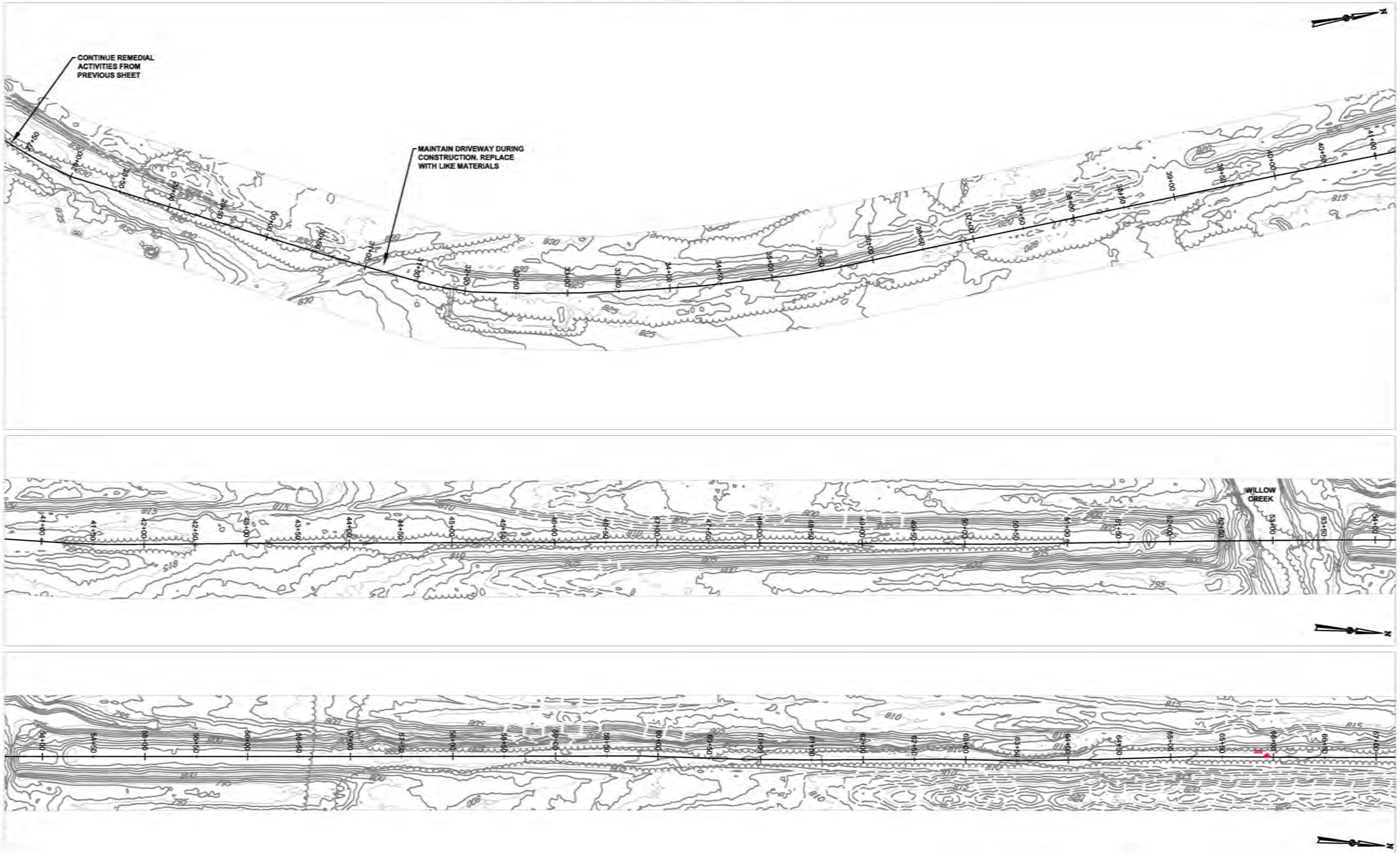
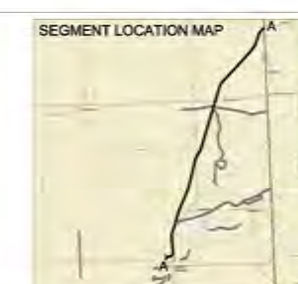
XREFS: Layout_Border C:\GRR basemap Mapping_Limits

SEGMENT A - STA 27+50 to 67+00



SEGMENT A SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

[these notes will be updated for the final version of drawings]



1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

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XREFS: Layout_Border CCRR basemap Mapping_Limits

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

DESIGNED BY: C. FERGUSON
DWN BY: T. BRASWELL
CKD BY: A. FLETCHER
SUBMITTED BY: HGL
PLOT SCALE: 1"=50'
PLOT DATE:
SIZE: ANSI D
FILE NAME: C:\Users\cferguson\Documents\0073 Cherokee County ... (Align_Aa)All_Sites.dwg
DATE: OCTOBER 2018
SOLICITATION NO.:
CONTRACT NO.: EP-S7-05-05 TO-0073
FILE NUMBER: EP0073

HGL

CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS

EXCAVATION AND RESTORATION PLAN
SEGMENT A, STA 27+50 to 67+00

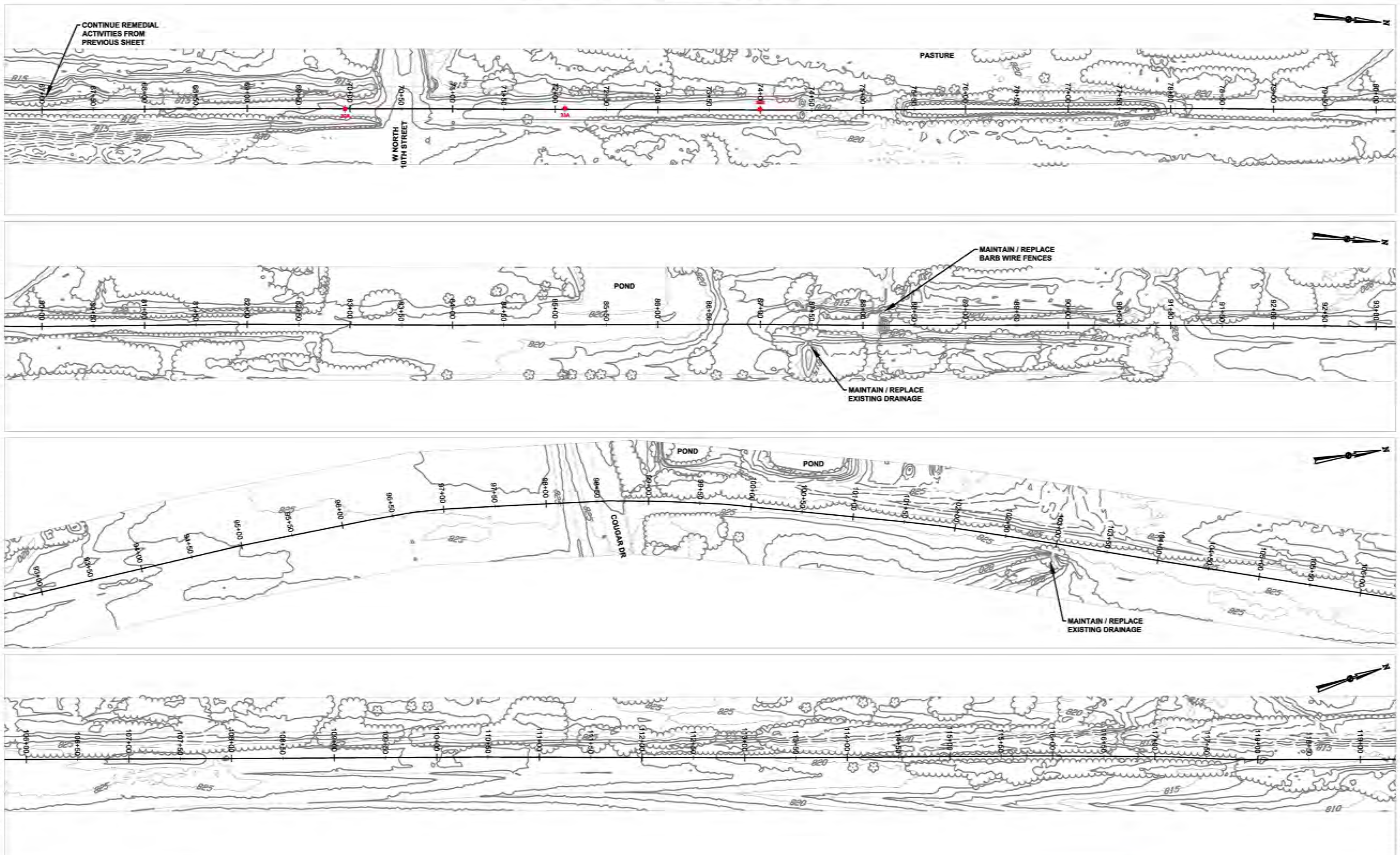
SHEET IDENTIFICATION
C-Ab

1 2 3 4 5

SEGMENT A - STA 67+00 to 119+00

MATCH TO RIGHT END OF BOTTOM VIEW SHEET C-Ab

MATCH TO LEFT END OF VIEW BELOW



MATCH TO RIGHT END OF VIEW ABOVE

MATCH TO LEFT END OF TOP VIEW SHEET C-Ad

AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT ___ RECEIVES STORMWATER RUNOFF FROM _________. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR ____________.

2. (*DISCUSS ACCESS, IF NEEDED, OR DELETE THIS NOTE*). CONTRACTOR SHALL MEET WITH THE PROPERTY OWNER AND EPA TO ESTABLISH THE LOCATION OF THE TEMPORARY ACCESS ROAD. THE ROAD AND EXISTING CHAT TRAIL SHALL BE REMOVED TO THE LIMITS OF CONSTRUCTION AS PART OF THE SITE RESTORATION ACTIVITIES

3. REFER TO THE NOTES ON SHEETS C-02 AND C-03 FOR ADDITIONAL INFORMATION.

SEGMENT LOCATION MAP

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

DESIGNED BY: C. FERGUSON | DATE: OCTOBER 2018
DWN BY: T. BRASWELL | CKD BY: A. FLETCHER | SOLICITATION NO.:
SUBMITTED BY: HGL | CONTRACT NO.: EP-S7-05-05 TO-0073
PLOT SCALE: 1"=50' | PLOT DATE: | FILE NUMBER: EP0073
SIZE: ANSI D | FILE NAME: C:\Users\cferguson\Documents\0073 Cherokee County... (Align_Aa)All_Sites.dwg

HGL HydroGeoLogic, Inc.

CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS

EXCAVATION AND RESTORATION PLAN
SEGMENT A, STA 67+00 to 119+00

SHEET IDENTIFICATION
C-Ac

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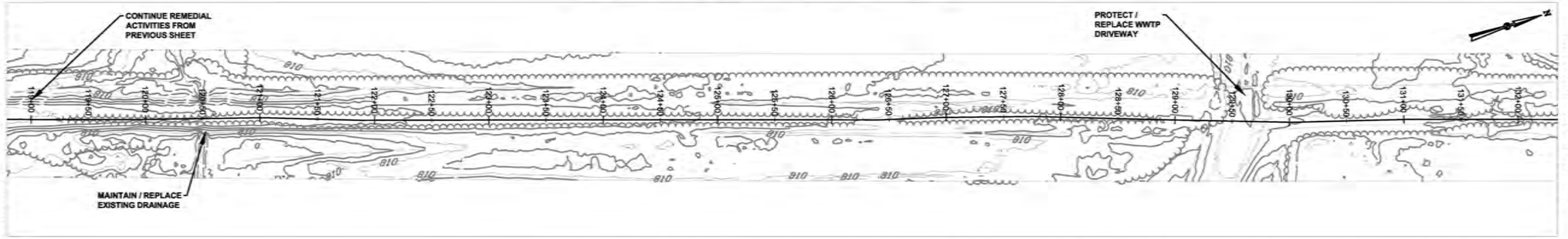
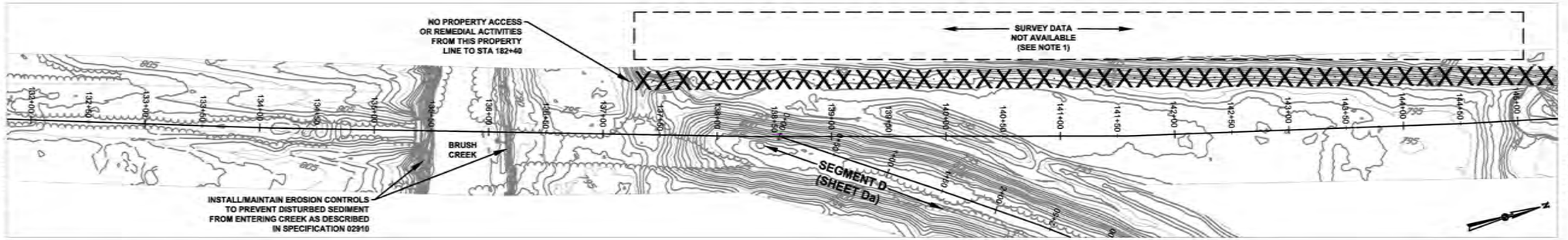
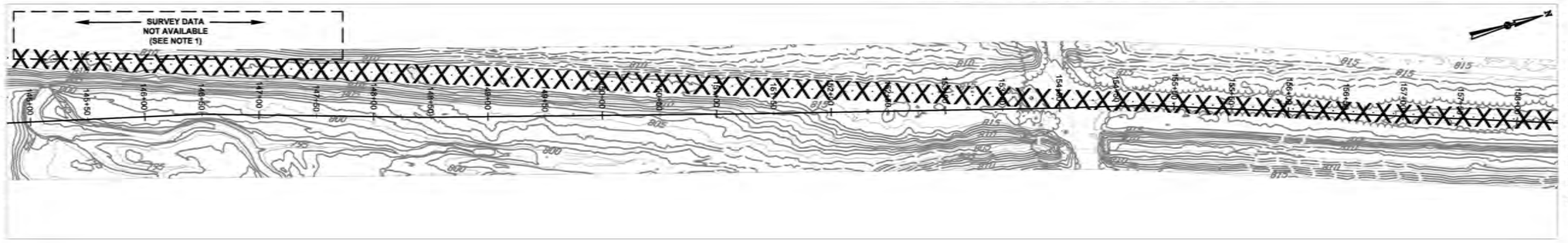
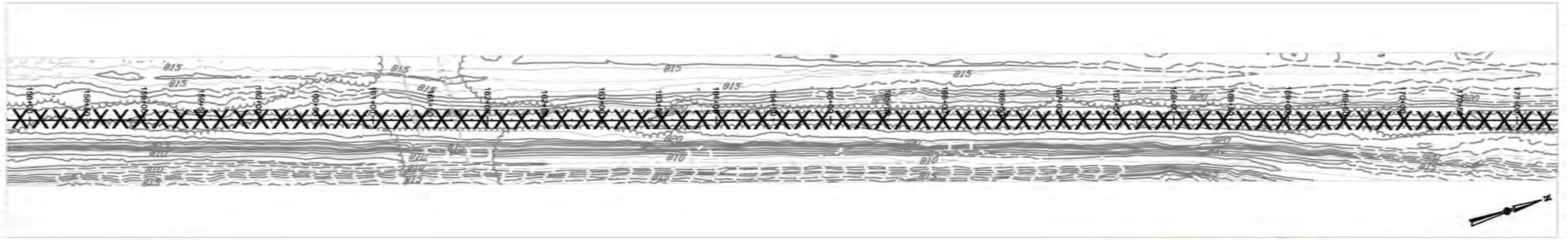
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT A - STA 119+00 to 171+00









SEGMENT A SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

[these notes will be updated for the final version of drawings]

SEGMENT LOCATION MAP

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

DESIGNED BY: C. FERGUSON
DRN BY: T. BRASWELL
CKD BY: A. FLETCHER
SUBMITTED BY: HGL
DATE: OCTOBER 2018
SOLICITATION NO.:
CONTRACT NO.: EP-S7-05-03 TO-0013
PLOT SCALE: 1"=50'
PLOT DATE:
FILE NUMBER: EP-0013
FILE NAME: C:\Users\CFERGUSON\AppData\Local\Temp\Align_AeAM_Sites.dwg
ANSI D

CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS

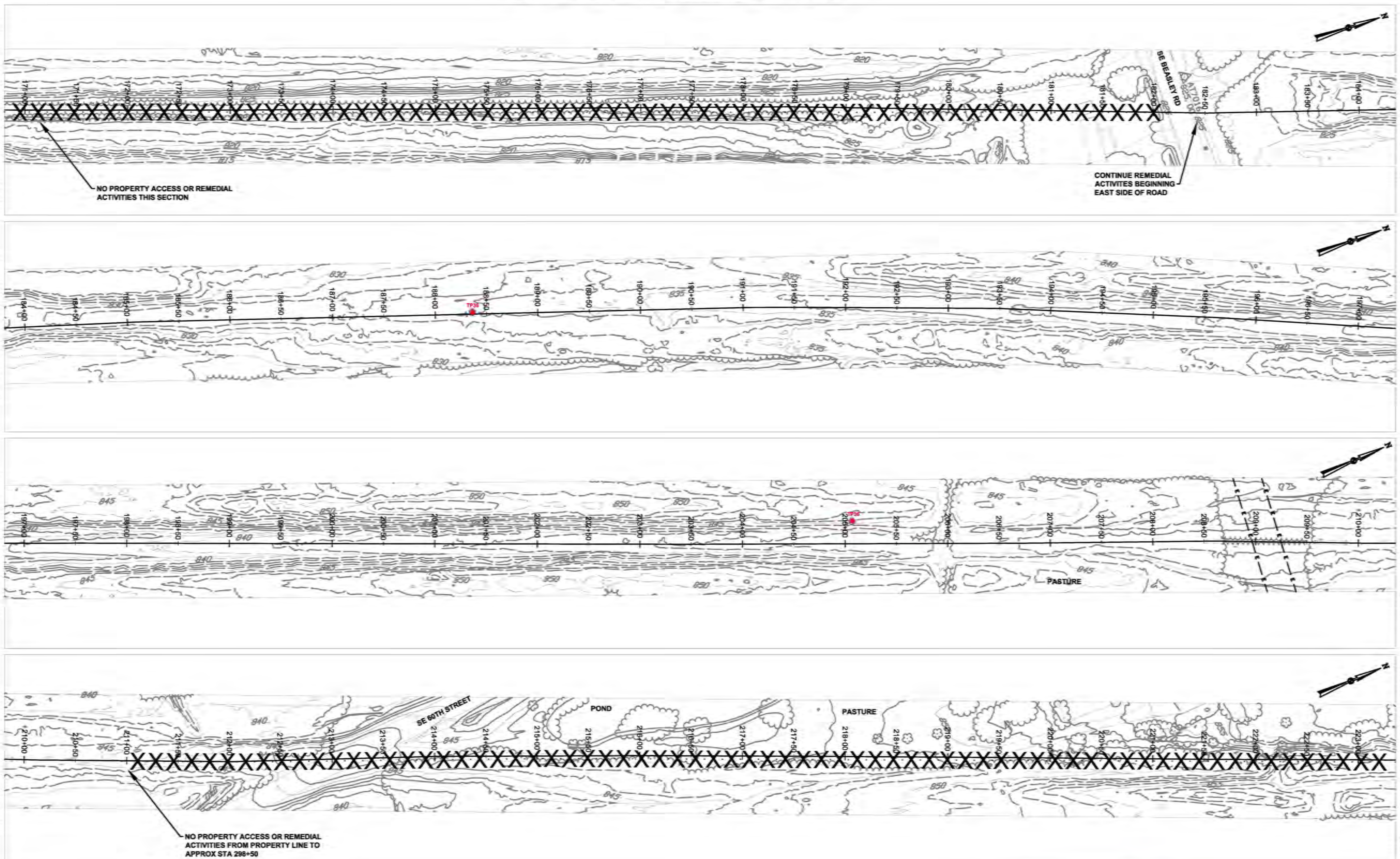
EXCAVATION AND RESTORATION PLAN
SEGMENT A, STA 119+00 to 171+00

SHEET IDENTIFICATION
C-Ad

DWG FILE: C:\Users\CFERGUSON\AppData\Local\Temp\Align_AeAM_Sites.dwg
SAVE DATE: Thursday, October 25, 2018 4:10 PM BY: Ferguson, Chad
PLOT DATE: Oct 25, 2018 4:10 PM BY: Ferguson
XREFS: Layout_Border CCRR Basemap Mapping_Limits

SEGMENT A - STA 171+00 to 223+00

MATCH TO RIGHT END OF BOTTOM VIEW SHEET C-Ad



MATCH TO LEFT END OF VIEW BELOW

MATCH TO RIGHT END OF VIEW ABOVE

MATCH TO LEFT END OF VIEW BELOW

MATCH TO RIGHT END OF VIEW ABOVE

MATCH TO LEFT END OF VIEW BELOW

MATCH TO RIGHT END OF VIEW ABOVE

MATCH TO LEFT END OF TOP VIEW SHEET C-Af

AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT ___ RECEIVES STORMWATER RUNOFF FROM ________. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR ___________.

2. (*DISCUSS ACCESS, IF NEEDED, OR DELETE THIS NOTE*). CONTRACTOR SHALL MEET WITH THE PROPERTY OWNER AND EPA TO ESTABLISH THE LOCATION OF THE TEMPORARY ACCESS ROAD. THE ROAD AND EXISTING CHAT TRAIL SHALL BE REMOVED TO THE LIMITS OF CONSTRUCTION AS PART OF THE SITE RESTORATION ACTIVITIES

3. REFER TO THE NOTES ON SHEETS C-02 AND C-03 FOR ADDITIONAL INFORMATION.

SEGMENT LOCATION MAP

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

HGL HydroGeoLogic, Inc.

DESIGNED BY: C. FERGUSON		DATE: OCTOBER 2018
DWN BY: T. BRASWELL	CKD BY: A. FLETCHER	SOLICITATION NO.:
SUBMITTED BY: HGL		CONTRACT NO.: EP-S7-05-05 TO-0073
PLOT SCALE: 1"=50'	PLOT DATE:	FILE NUMBER: EP0073
SIZE: ANSI D	FILE NAME: C:\Users\cferguson\Documents\0073 Cherokee County... (Align_Aa)All_Sites.dwg	

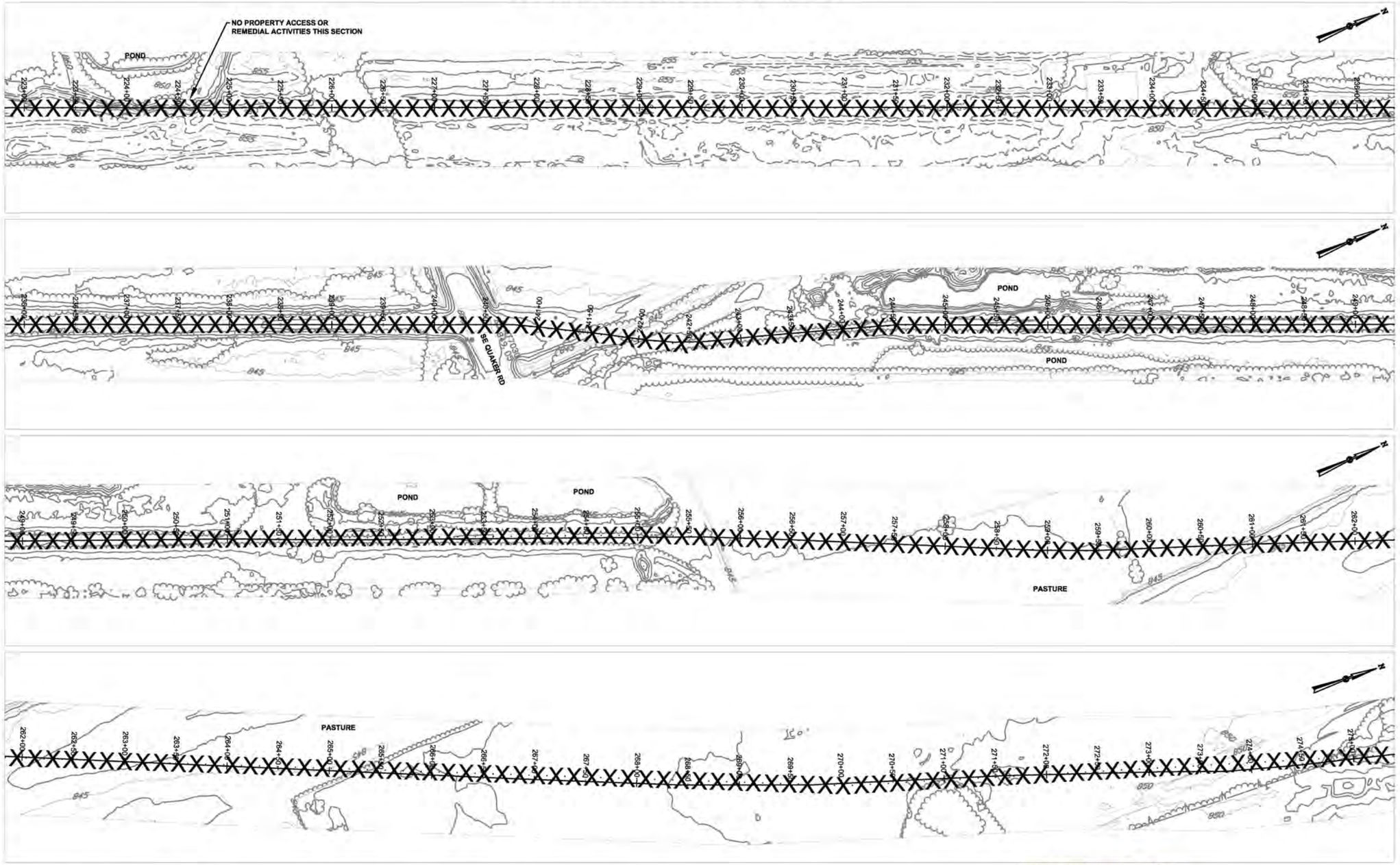
CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS

EXCAVATION AND RESTORATION PLAN
SEGMENT A, STA 171+00 to 223+00

SHEET IDENTIFICATION
C-Ae

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Align_Aa)All_Sites.dwg
SAVE DATE: Oct 17, 2018 11:28 AM BY: Cferguson PLOT DATE: Oct 17, 2018 11:30 AM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT A - STA 223+00 to 275+00



AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT ___ RECEIVES STORMWATER RUNOFF FROM _____. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR _____.

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3. REFER TO THE NOTES ON SHEETS C-02 AND C-03 FOR ADDITIONAL INFORMATION.

SEGMENT LOCATION MAP

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

DESIGNED BY: C. FERGUSON	DATE: OCTOBER 2018
DWN BY: T. BRASWELL	SOLICITATION NO.:
CKD BY: A. FLETCHER	CONTRACT NO.: EP078C21TO0073
SUBMITTED BY: HGL	FILE NUMBER: EP0073
PLOT SCALE: 1"=50'	PLOT DATE:
SIZE: ANSI D	FILE NAME: C:\Users\fergusonc\Documents\0073 Cherokee County OU8 RRS\Auto\CAD\Align_As\All_Sites.dwg

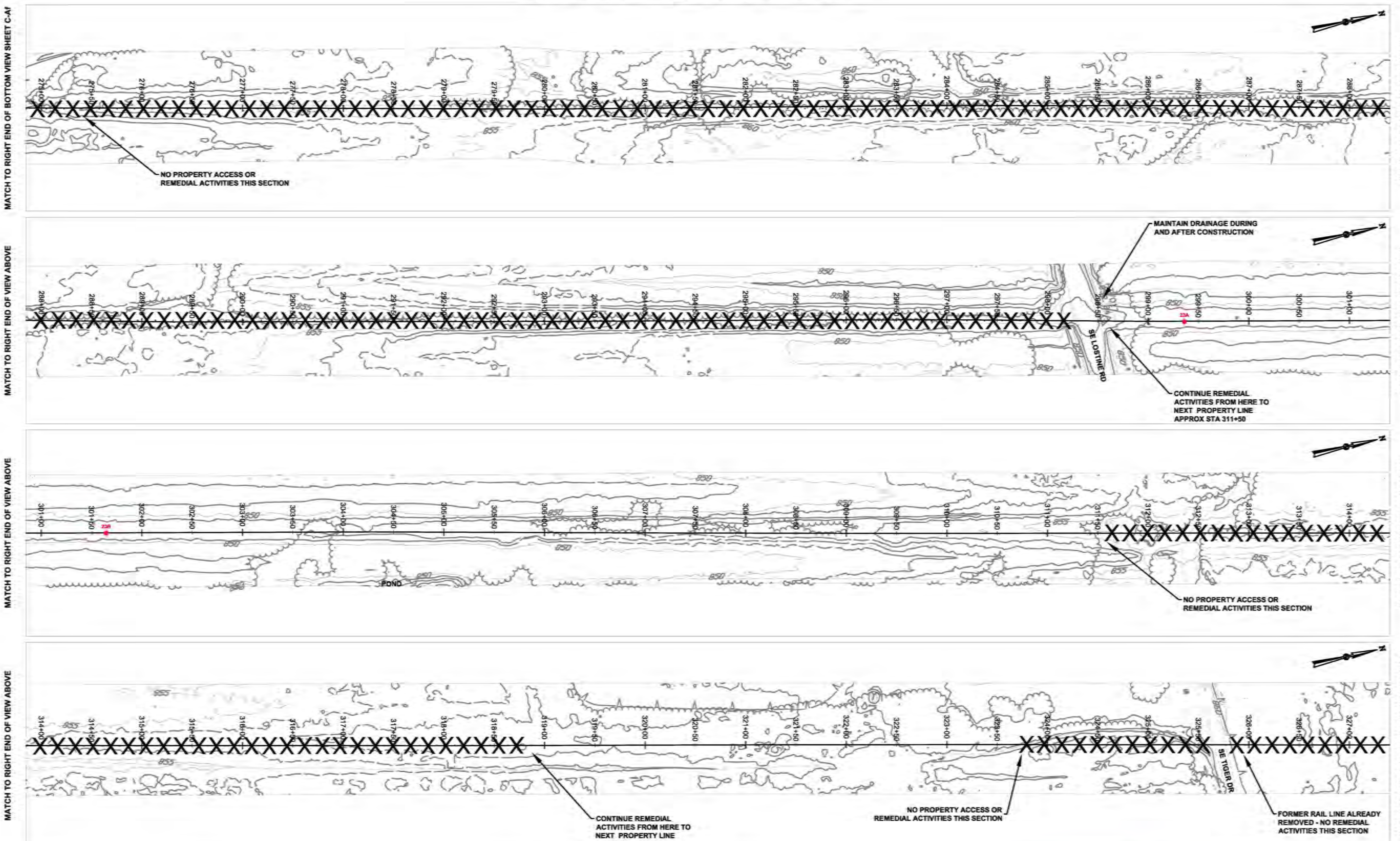
CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS

EXCAVATION AND RESTORATION PLAN
SEGMENT A, STA 223+00 to 275+00

SHEET IDENTIFICATION
C-Af

DWG FILE: C:\Users\fergusonc\Documents\0073 Cherokee County OU8 RRS\Auto\CAD\Align_As\All_Sites.dwg
SAVE DATE: Oct 17, 2018 11:28 AM BY: Cferguson PLOT DATE: Oct 17, 2018 11:31 AM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT A - STA 275+00 to 327+00



AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT ___ RECEIVES STORMWATER RUNOFF FROM _________. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR ____________.

2. (*DISCUSS ACCESS, IF NEEDED, OR DELETE THIS NOTE*). CONTRACTOR SHALL MEET WITH THE PROPERTY OWNER AND EPA TO ESTABLISH THE LOCATION OF THE TEMPORARY ACCESS ROAD. THE ROAD AND EXISTING CHAT TRAIL SHALL BE REMOVED TO THE LIMITS OF CONSTRUCTION AS PART OF THE SITE RESTORATION ACTIVITIES

3. REFER TO THE NOTES ON SHEETS C-02 AND C-03 FOR ADDITIONAL INFORMATION.

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

HGL HydroGeoLogic, Inc.

DESIGNED BY: C. FERGUSON	DATE: OCTOBER 2018
DWN BY: T. BRASWELL / CKD BY: A. FLETCHER	SOLICITATION NO.:
SUBMITTED BY: HGL	CONTRACT NO.: EP-S7-05-05 TO-0073
PLOT SCALE: 1"=50' / PLOT DATE:	FILE NUMBER: EP0073
SIZE: ANSI D	FILE NAME: C:\Users\cferguson\Documents\0073 Cherokee County ... (Align_Aa)All_Sites.dwg

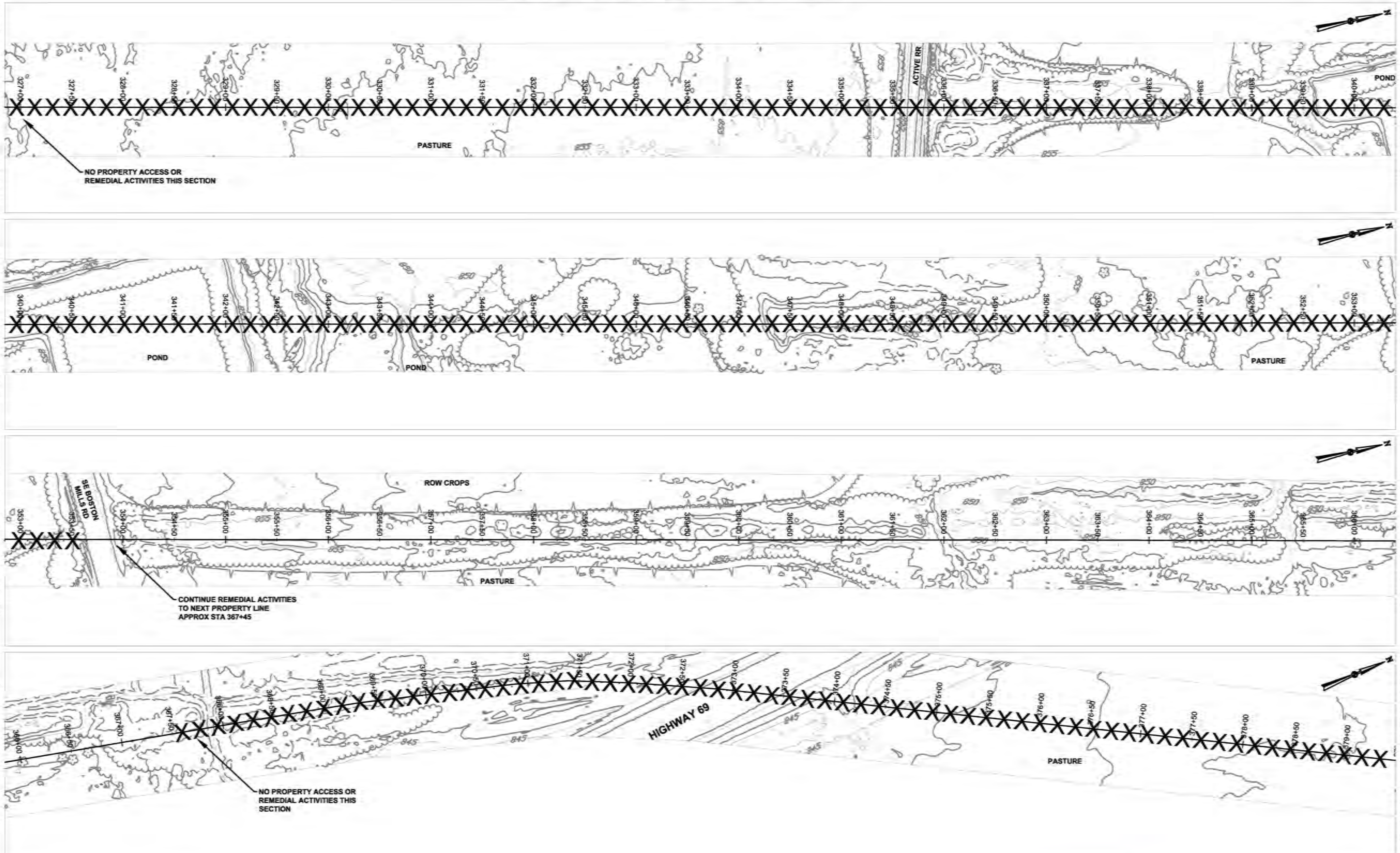
CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS

EXCAVATION AND RESTORATION PLAN
SEGMENT A, STA 275+00 to 327+00

SHEET IDENTIFICATION
C-Ag

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Align_Aa)All_Sites.dwg
SAVE DATE: Oct 17, 2018 11:28 AM BY: Cferguson PLOT DATE: Oct 17, 2018 11:33 AM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT A - STA 327+00 to 379+00



AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT ___ RECEIVES STORMWATER RUNOFF FROM ________. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR ___________.

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3. REFER TO THE NOTES ON SHEETS C-02 AND C-03 FOR ADDITIONAL INFORMATION.

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

DESIGNED BY: C. FERGUSON | DATE: OCTOBER 2018
DWN BY: T. BRASWELL | CKD BY: A. FLETCHER | SOLICITATION NO.:
SUBMITTED BY: HGL | CONTRACT NO.: EP-S7-05-05 TO-0073
PLOT SCALE: 1"=50' | PLOT DATE: | FILE NUMBER: EP9073
SIZE: ANSI D | FILE NAME: C:\Users\cferguson\Documents\0073 Cherokee County ... (Align_Aa)All_Sites.dwg

HGL HydroGeoLogic, Inc.

CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS
EXCAVATION AND RESTORATION PLAN
SEGMENT A, STA 327+00 to 379+00

SHEET IDENTIFICATION
C-Ah

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Align_Aa)All_Sites.dwg
SAVE DATE: Oct 17, 2018 11:28 AM BY: Cferguson PLOT DATE: Oct 17, 2018 11:34 AM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT A - STA 379+00 to 431+50

MATCH TO RIGHT END OF BOTTOM VIEW SHEET C-Ah

MATCH TO LEFT END OF VIEW BELOW

MATCH TO RIGHT END OF VIEW ABOVE

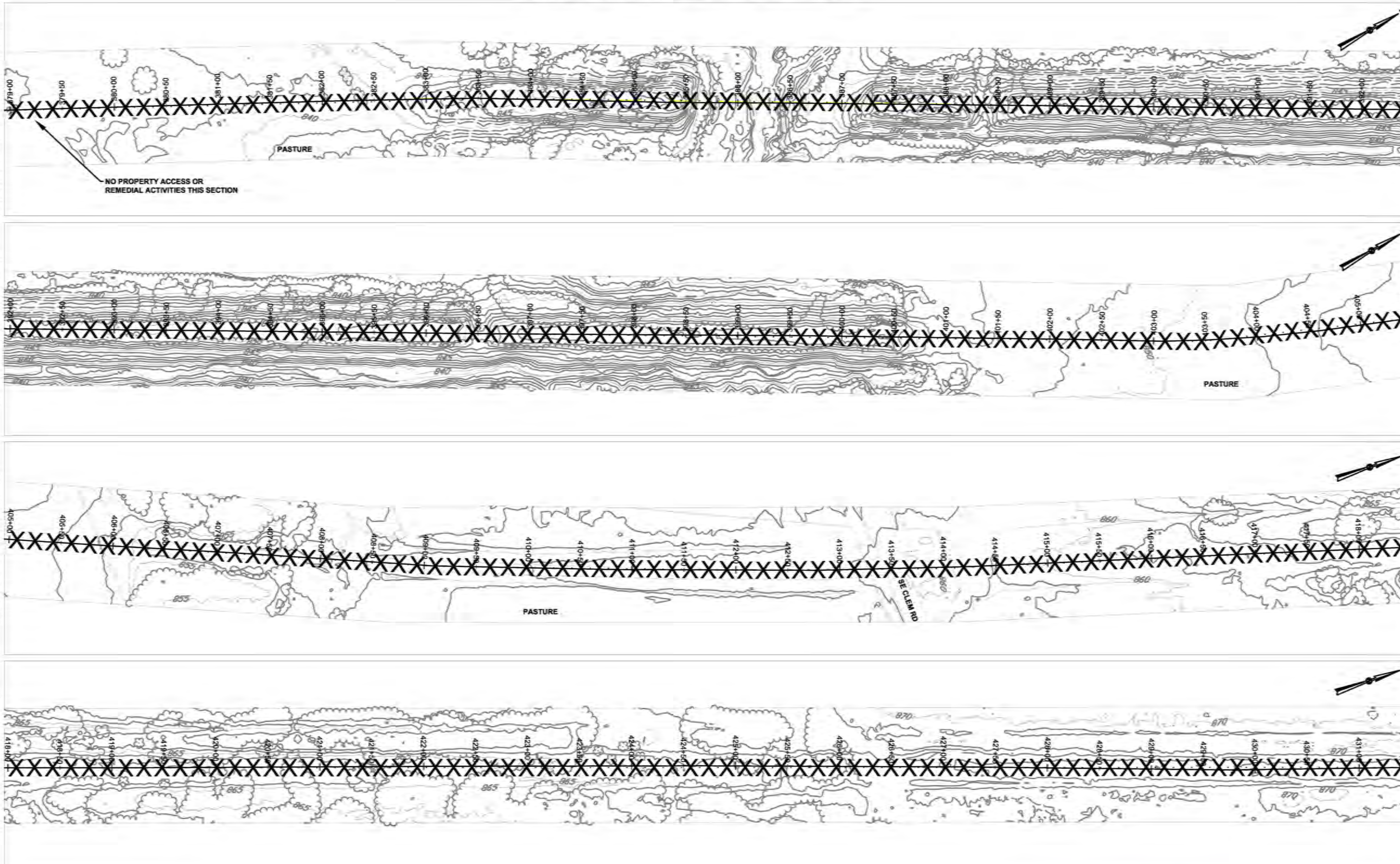
MATCH TO LEFT END OF VIEW BELOW

MATCH TO RIGHT END OF VIEW ABOVE

MATCH TO LEFT END OF VIEW BELOW

MATCH TO RIGHT END OF VIEW ABOVE

MATCH TO LEFT END OF TOP VIEW SHEET C-Aj



AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT ___ RECEIVES STORMWATER RUNOFF FROM _________. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR ____________.

2. (*DISCUSS ACCESS, IF NEEDED, OR DELETE THIS NOTE*). CONTRACTOR SHALL MEET WITH THE PROPERTY OWNER AND EPA TO ESTABLISH THE LOCATION OF THE TEMPORARY ACCESS ROAD. THE ROAD AND EXISTING CHAT TRAIL SHALL BE REMOVED TO THE LIMITS OF CONSTRUCTION AS PART OF THE SITE RESTORATION ACTIVITIES

3. REFER TO THE NOTES ON SHEETS C-02 AND C-03 FOR ADDITIONAL INFORMATION.

SEGMENT LOCATION MAP

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

DESIGNED BY: C. FERGUSON		DATE: OCTOBER 2018
DWN BY: T. BRASWELL	CKD BY: C. ROBB	SOLICITATION NO.:
SUBMITTED BY: HGL		CONTRACT NO.: EP-S7-05-05 TO-0073
PLOT SCALE: 1"=50'	PLOT DATE:	FILE NUMBER: EP0073
SIZE: ANSI D	FILE NAME: C:\Users\cferguson\Documents\0073 Cherokee County... (Align_Aa)All_Sites.dwg	

HGL

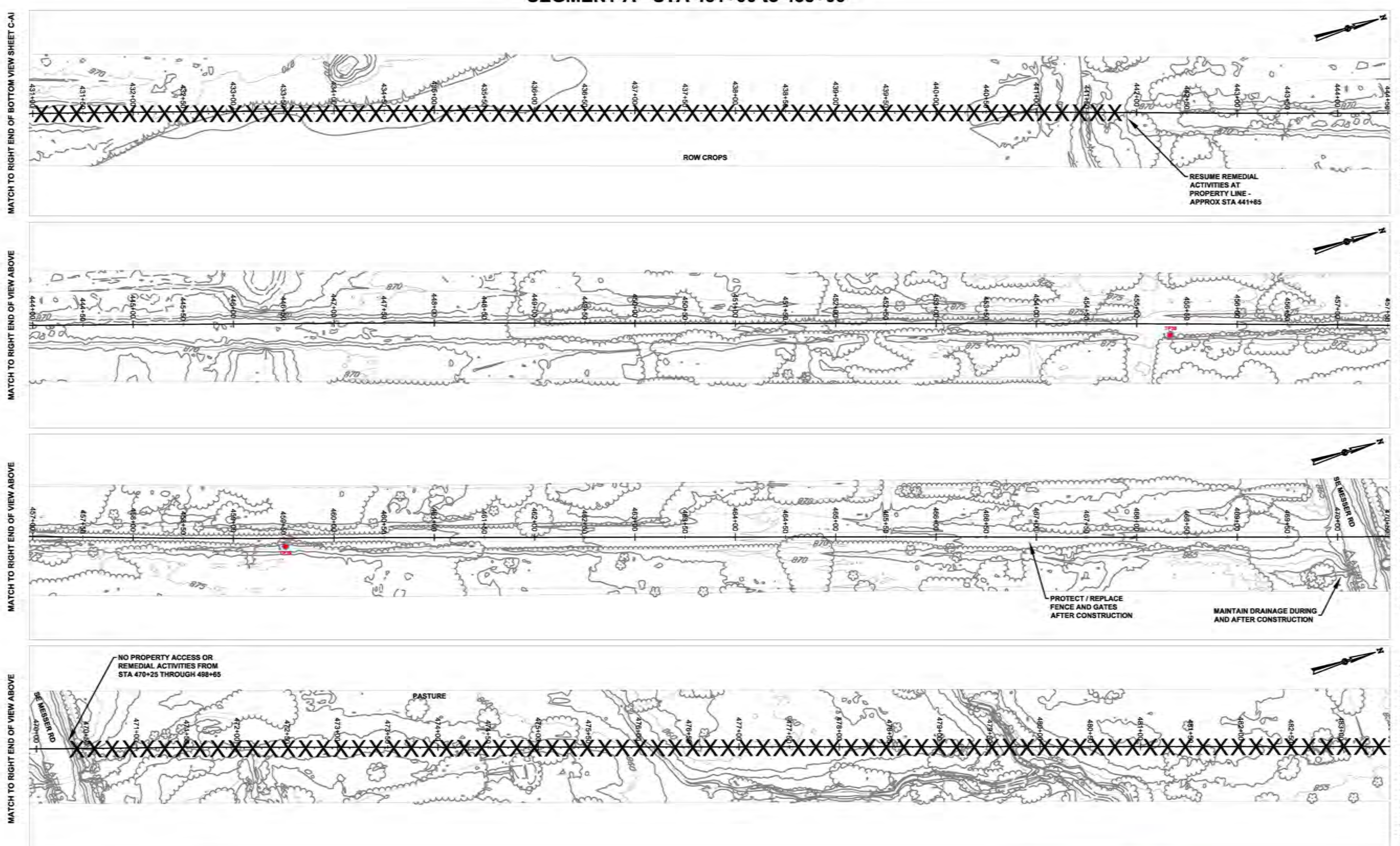
CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS

EXCAVATION AND RESTORATION PLAN
SEGMENT A, STA 379+00 to 431+50

SHEET IDENTIFICATION
C-Ai

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Align_Aa)All_Sites.dwg
SAVE DATE: Oct 17, 2018 11:28 AM BY: Cferguson PLOT DATE: Oct 17, 2018 11:35 AM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT A - STA 431+00 to 483+00



<u>AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:</u>
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT ___ RECEIVES STORMWATER RUNOFF FROM ________. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR ___________.

2. (*DISCUSS ACCESS, IF NEEDED, OR DELETE THIS NOTE*). CONTRACTOR SHALL MEET WITH THE PROPERTY OWNER AND EPA TO ESTABLISH THE LOCATION OF THE TEMPORARY ACCESS ROAD. THE ROAD AND EXISTING CHAT TRAIL SHALL BE REMOVED TO THE LIMITS OF CONSTRUCTION AS PART OF THE SITE RESTORATION ACTIVITIES

3. REFER TO THE NOTES ON SHEETS C-02 AND C-03 FOR ADDITIONAL INFORMATION.

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK | DESCRIPTION | DATE | APPR

DESIGNED BY: C. FERGUSON
DWN BY: T. BRASWELL
CKD BY: A. FLETCHER
SUBMITTED BY: HGL
PLOT SCALE: 1"=50'
PLOT DATE:
SIZE: ANSI D
FILE NAME: C:\Users\cferguson\Documents\0073 Cherokee County...(Align_Aa)All_Sites.dwg
DATE: OCTOBER 2018
SOLICITATION NO.:
CONTRACT NO.: EP-S7-05-05 TO-0073
FILE NUMBER: EP0073

HGL HydroGeoLogic, Inc.

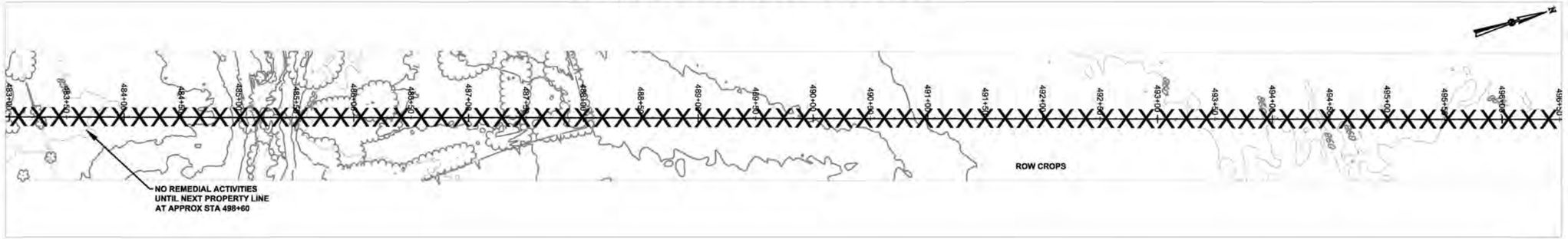
CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS
EXCAVATION AND RESTORATION PLAN
SEGMENT A, STA 431+00 to 483+00

SHEET IDENTIFICATION
C-Aj

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Align_Aa)All_Sites.dwg
SAVE DATE: Oct 17, 2018 11:28 AM BY: Cferguson PLOT DATE: Oct 17, 2018 11:37 AM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT A - STA 483+00 to 535+50

MATCH TO RIGHT END OF BOTTOM VIEW SHEET C-Aj



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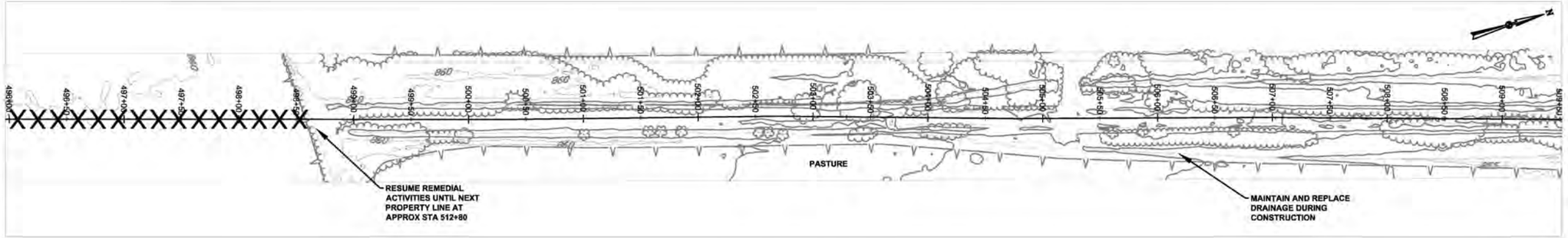

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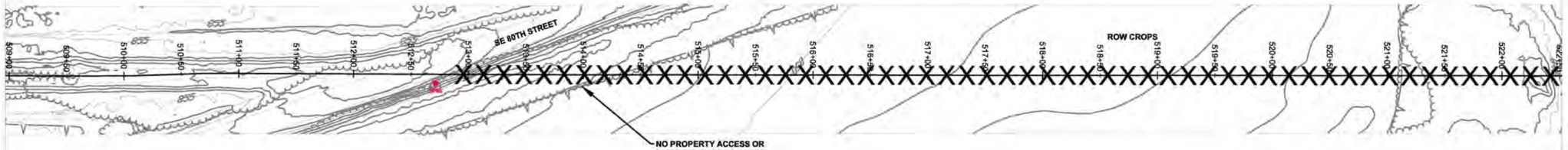

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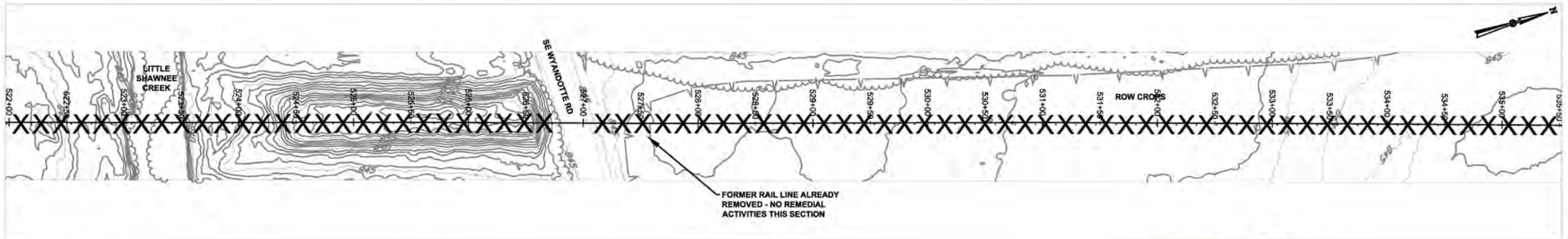
MATCH TO RIGHT END OF VIEW ABOVE



MATCH TO LEFT END OF TOP VIEW SHEET C-AI

AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT ___ RECEIVES STORMWATER RUNOFF FROM _____. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR _____.

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3. REFER TO THE NOTES ON SHEETS C-02 AND C-03 FOR ADDITIONAL INFORMATION.

SEGMENT LOCATION MAP

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

DESIGNED BY: C. FERGUSON
DWN BY: T. BRASWELL
SUBMITTED BY:
PLOT SCALE: 1"=50'
SIZE: ANSI D
DATE: OCTOBER 2018
SOLICITATION NO.:
CKD BY: A. FLETCHER
CONTRACT NO: EP078C17TO0073
FILE NUMBER: EP9073
PLOT DATE:
FILE NAME: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRS\AutoCAD\Align_Aa\All_Sites.dwg

HGL

CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS

EXCAVATION AND RESTORATION PLAN
SEGMENT A, STA 483+00 to 535+50

SHEET IDENTIFICATION
C-Ak

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRS\AutoCAD\Align_Aa\All_Sites.dwg
SAVE DATE: Oct 17, 2018 11:28 AM BY: Cferguson PLOT DATE: Oct 17, 2018 11:38 AM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT A (NORTH PORTION - STA 535+00 to 587+50

MATCH TO RIGHT END OF BOTTOM VIEW SHEET C-Ak

MATCH TO LEFT END OF VIEW BELOW

MATCH TO RIGHT END OF VIEW ABOVE

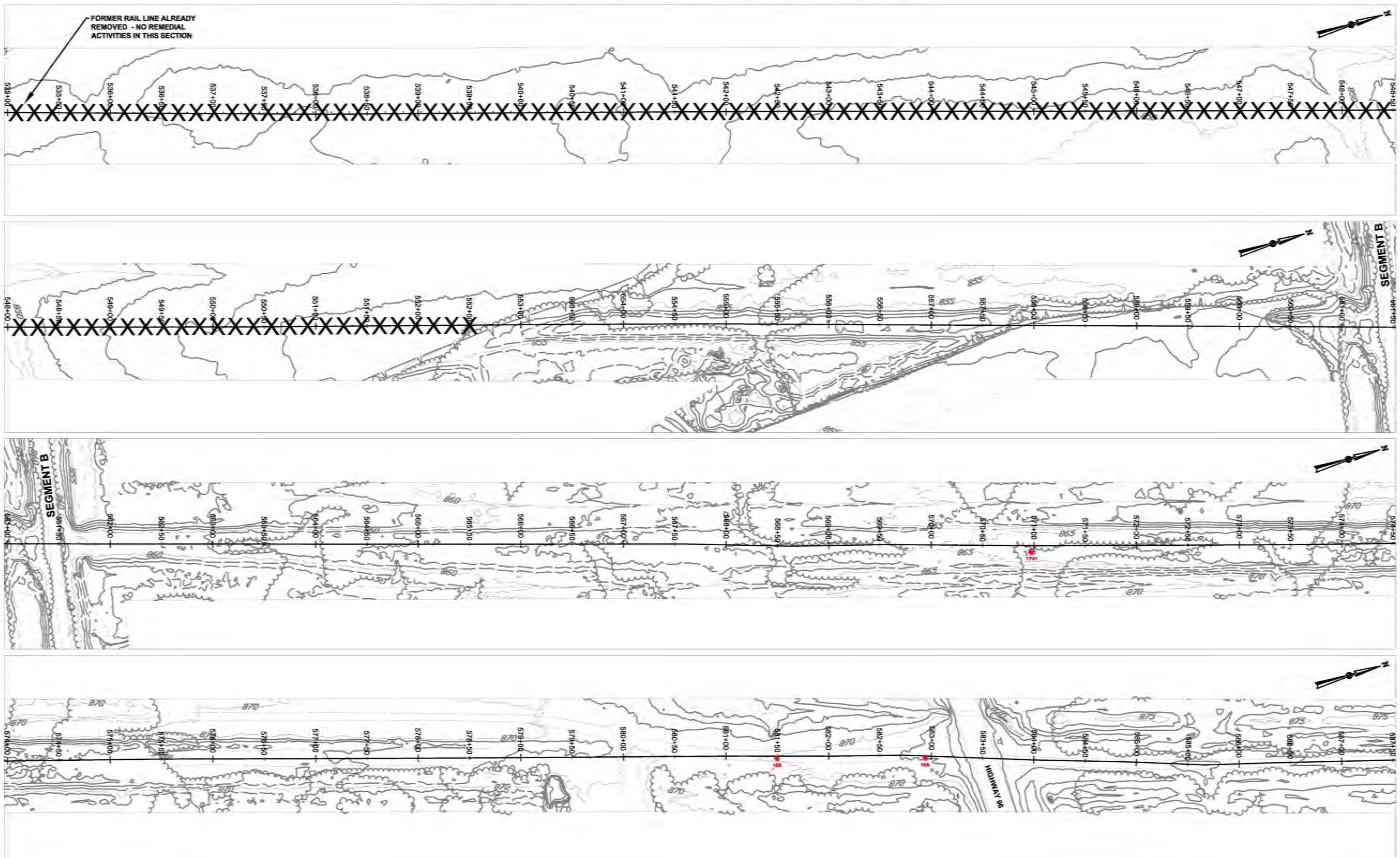
MATCH TO LEFT END OF VIEW BELOW

MATCH TO RIGHT END OF VIEW ABOVE

MATCH TO LEFT END OF VIEW BELOW

MATCH TO RIGHT END OF VIEW ABOVE

MATCH TO LEFT END OF TOP VIEW SHEET C-Am



AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT ___ RECEIVES STORMWATER RUNOFF FROM ________. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR ___________.

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3. REFER TO THE NOTES ON SHEETS C-02 AND C-03 FOR ADDITIONAL INFORMATION.

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

HGL HydroGeoLogic, Inc.

DESIGNED BY: C. FERGUSON	DATE: OCTOBER 2018
DWN BY: T. BRASWELL / CKD BY: A. FLETCHER	SOLICITATION NO.:
SUBMITTED BY: HGL	CONTRACT NO.: EP-S7-05-05 TO-0073
PLOT SCALE: 1"=50' / PLOT DATE:	FILE NUMBER: EP0073
SIZE: ANSI D	FILE NAME: C:\Users\cferguson\Documents\0073 Cherokee County (Align_Aa)All_Sites.dwg

CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS

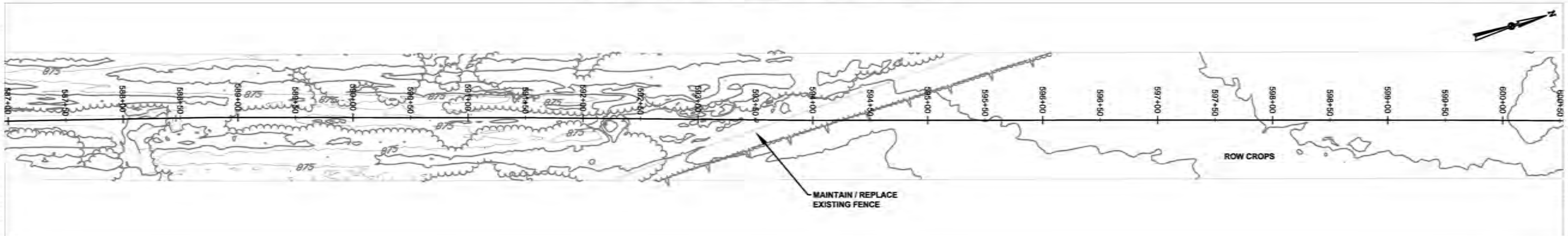
EXCAVATION AND RESTORATION PLAN
SEGMENT A, STA 535+00 to 587+50

SHEET IDENTIFICATION
C-Al

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Align_Aa)All_Sites.dwg
SAVE DATE: Oct 17, 2018 11:40 AM BY: Cferguson PLOT DATE: Oct 17, 2018 11:42 AM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

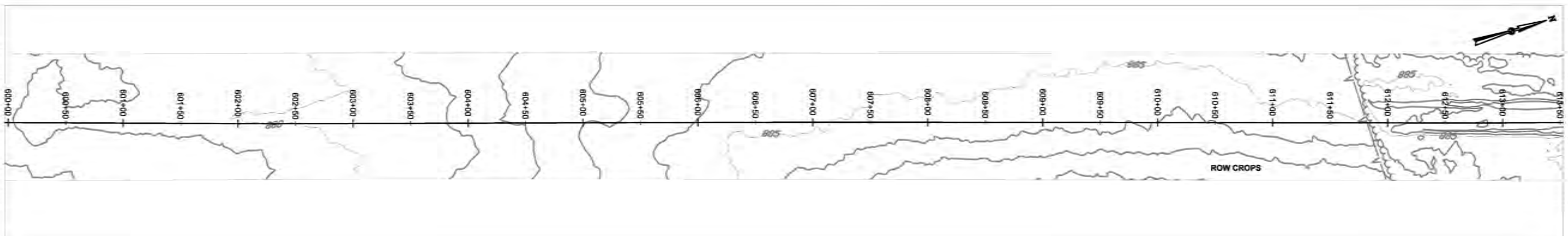
SEGMENT A - STA 587+00 to 639+50

MATCH TO RIGHT END OF BOTTOM VIEW SHEET C-Al



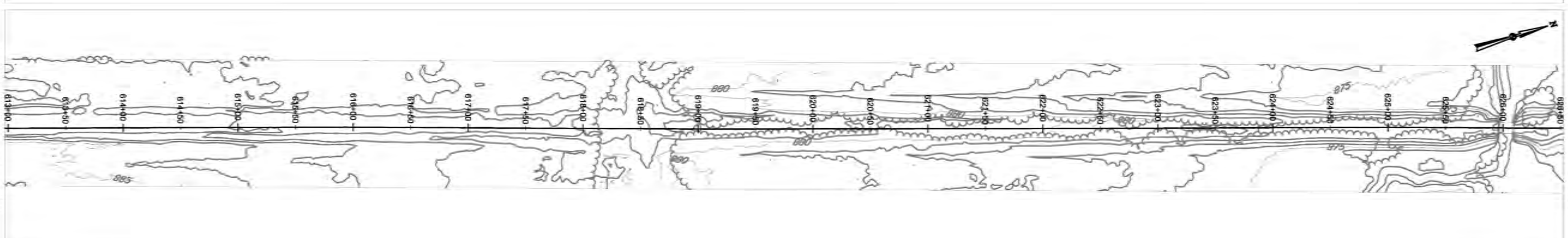
MATCH TO LEFT END OF VIEW BELOW

MATCH TO RIGHT END OF VIEW ABOVE



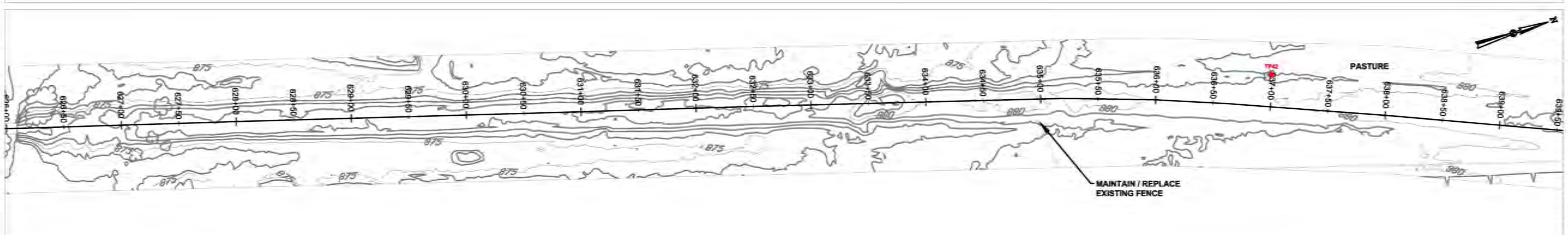
MATCH TO LEFT END OF VIEW BELOW

MATCH TO RIGHT END OF VIEW ABOVE



MATCH TO LEFT END OF VIEW BELOW

MATCH TO RIGHT END OF VIEW ABOVE



MATCH TO LEFT END OF TOP VIEW SHEET C-An

AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT ___ RECEIVES STORMWATER RUNOFF FROM ________. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR ___________.

2. (*DISCUSS ACCESS, IF NEEDED, OR DELETE THIS NOTE*). CONTRACTOR SHALL MEET WITH THE PROPERTY OWNER AND EPA TO ESTABLISH THE LOCATION OF THE TEMPORARY ACCESS ROAD. THE ROAD AND EXISTING CHAT TRAIL SHALL BE REMOVED TO THE LIMITS OF CONSTRUCTION AS PART OF THE SITE RESTORATION ACTIVITIES

3. REFER TO THE NOTES ON SHEETS C-02 AND C-03 FOR ADDITIONAL INFORMATION.

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

DESIGNED BY: C. FERGUSON | DATE: OCTOBER 2018
DWN BY: T. BRASWELL | CKD BY: A. FLETCHER | SOLICITATION NO.:
SUBMITTED BY: HGL | CONTRACT NO.: EP-S7-05-05 TO-0073
PLOT SCALE: 1"=50' | PLOT DATE: | FILE NUMBER: EP0073
SIZE: ANSI D | FILE NAME: C:\Users\cferguson\Documents\0073 Cherokee County (Align_Aa)All_Sites.dwg

HGL HydroGeoLogic, Inc.

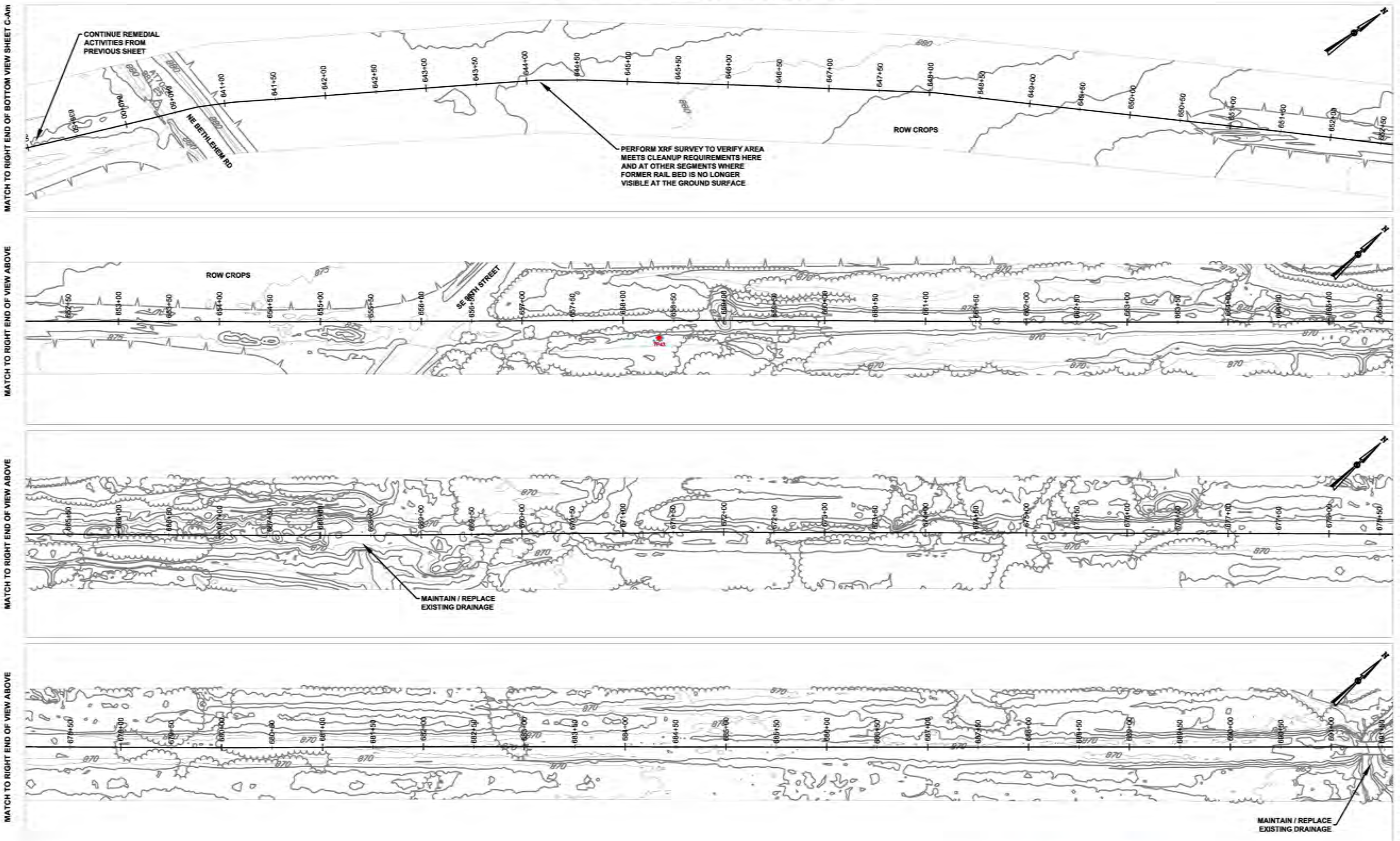
CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS

EXCAVATION AND RESTORATION PLAN
SEGMENT A, STA 587+00 to 639+50

SHEET IDENTIFICATION
C-Am

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Align_Aa)All_Sites.dwg
SAVE DATE: Oct 17, 2018 11:40 AM BY: Cferguson PLOT DATE: Oct 17, 2018 11:45 AM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT A - STA 639+50 to 691+50



SEGMENT A SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

[these notes will be updated for the final version of drawings]

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

HGL

DESIGNED BY: C. FERGUSON
DATE: OCTOBER 2018
DWN BY: T. BRASWELL
CKD BY: A. FLETCHER
SOLICITATION NO.:
SUBMITTED BY: HGL
CONTRACT NO.: EP-S7-05-05 TO-0073
PLOT SCALE: 1"=50'
PLOT DATE:
FILE NUMBER: EP0073
SIZE: ANSI D
FILE NAME: (Align_Aa)All_Sites.dwg

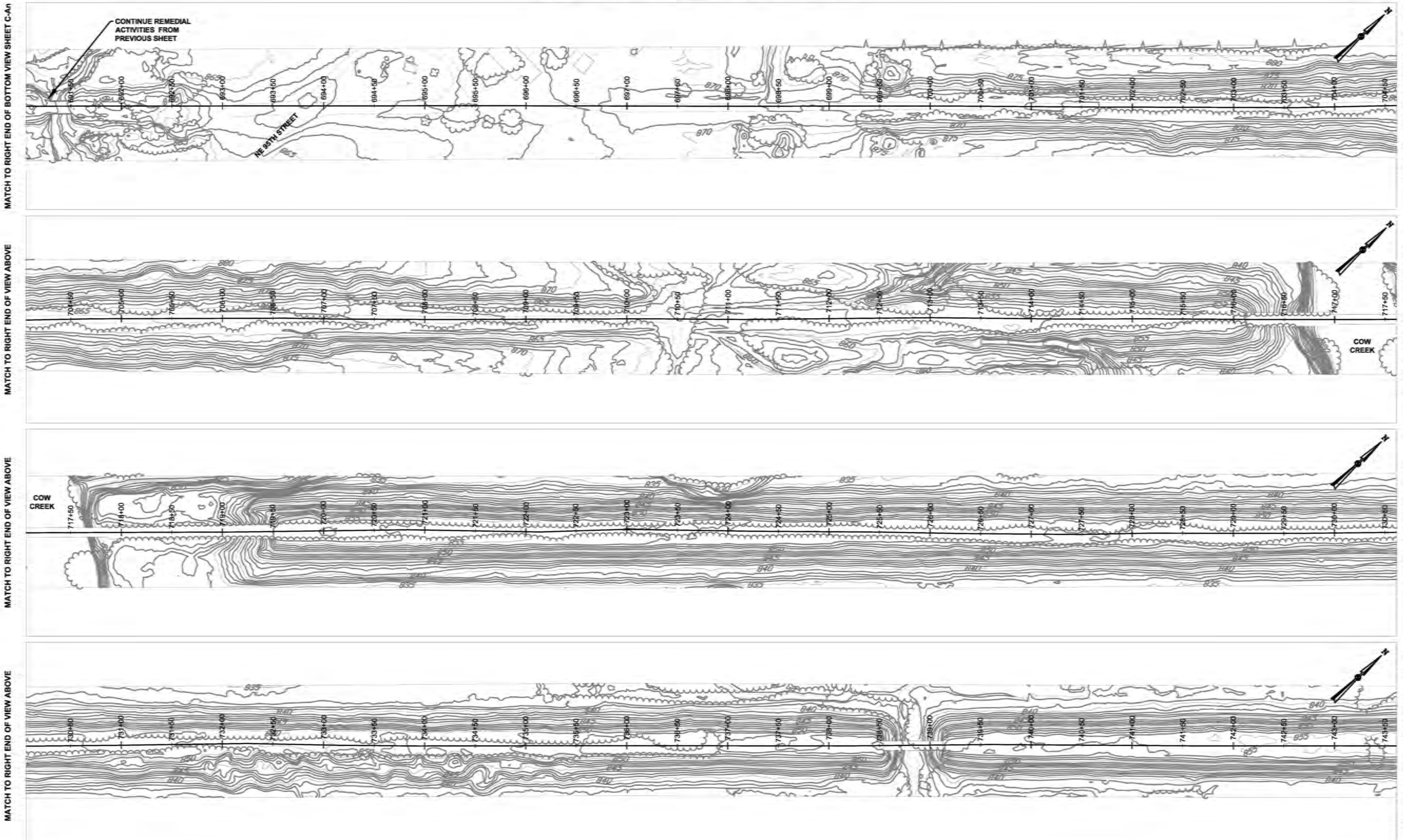
CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS

EXCAVATION AND RESTORATION PLAN
SEGMENT A, STA 639+50 to 691+50

SHEET IDENTIFICATION
C-An

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Align_Aa)All_Sites.dwg
SAVE DATE: Oct 26, 2018 1:28 PM BY: Cferguson PLOT DATE: Oct 26, 2018 1:28 PM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT A - STA 691+50 to 743+50



AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT ___ RECEIVES STORMWATER RUNOFF FROM ________. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR ___________.

2. (*DISCUSS ACCESS, IF NEEDED, OR DELETE THIS NOTE*). CONTRACTOR SHALL MEET WITH THE PROPERTY OWNER AND EPA TO ESTABLISH THE LOCATION OF THE TEMPORARY ACCESS ROAD. THE ROAD AND EXISTING CHAT TRAIL SHALL BE REMOVED TO THE LIMITS OF CONSTRUCTION AS PART OF THE SITE RESTORATION ACTIVITIES

3. REFER TO THE NOTES ON SHEETS C-02 AND C-03 FOR ADDITIONAL INFORMATION.

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

DESIGNED BY: C. FERGUSON | DATE: OCTOBER 2018
DWN BY: T. BRASWELL | CKD BY: A. FLETCHER | SOLICITATION NO.:
SUBMITTED BY: HGL | CONTRACT NO.: EP-S7-05-05 TO-0073
PLOT SCALE: 1"=50' | PLOT DATE: | FILE NUMBER: EP0073
SIZE: ANSI D | FILE NAME: C:\Users\cferguson\Documents\0073 Cherokee County... (Align_Aa)All_Sites.dwg

HGL HydroGeoLogic, Inc

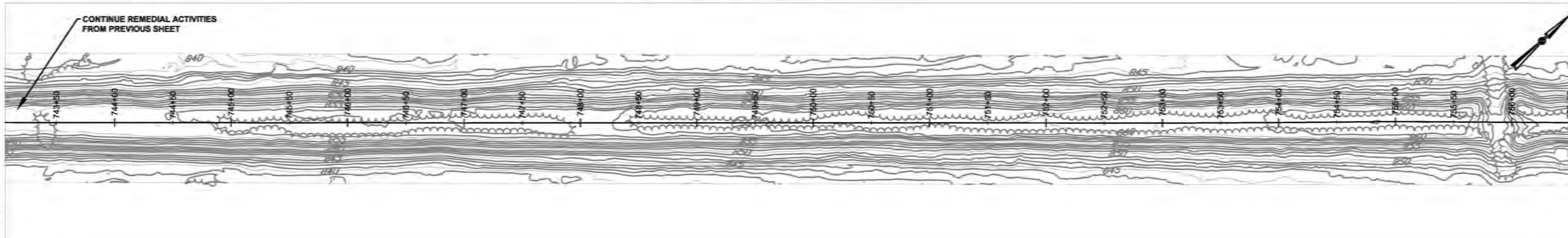
CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS
EXCAVATION AND RESTORATION PLAN
SEGMENT A, STA 691+50 to 743+50

SHEET IDENTIFICATION
C-Ao

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Align_Aa)All_Sites.dwg
SAVE DATE: Oct 17, 2018 11:40 AM BY: Cferguson PLOT DATE: Oct 17, 2018 11:43 AM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

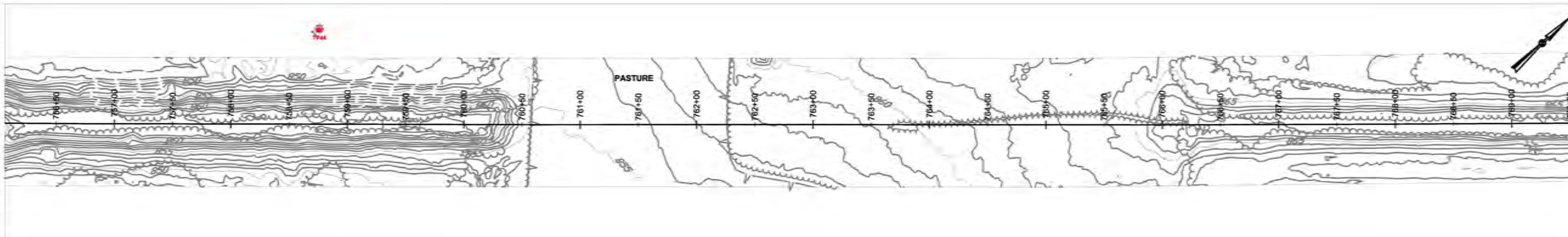
SEGMENT A - 743+50 to 795+50

MATCH TO RIGHT END OF BOTTOM VIEW SHEET C-Ao



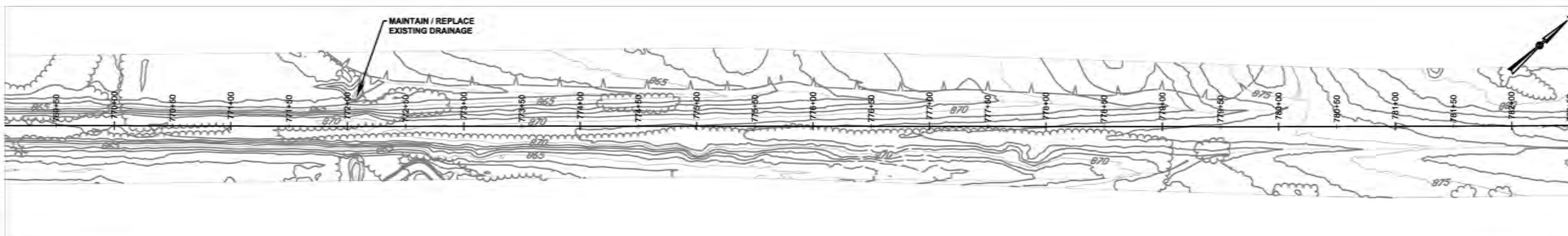
MATCH TO LEFT END OF VIEW BELOW

MATCH TO RIGHT END OF VIEW ABOVE



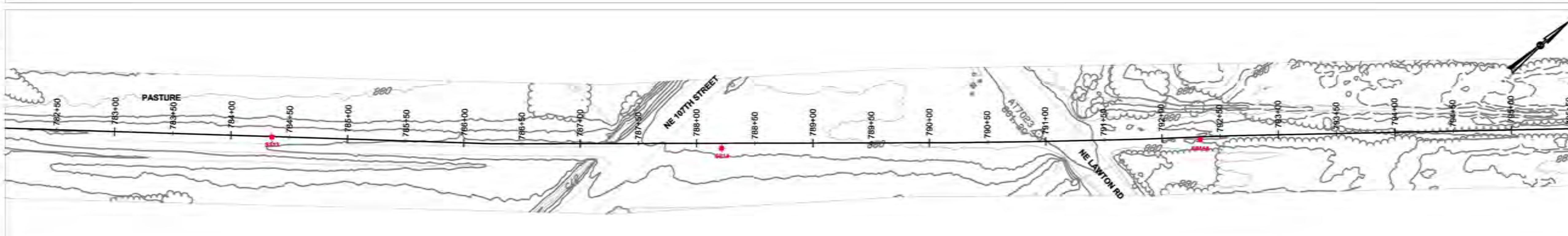
MATCH TO LEFT END OF VIEW BELOW

MATCH TO RIGHT END OF VIEW ABOVE



MATCH TO LEFT END OF VIEW BELOW

MATCH TO RIGHT END OF VIEW ABOVE



MATCH TO LEFT END OF TOP VIEW SHEET C-Aq

AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT ___ RECEIVES STORMWATER RUNOFF FROM ________. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR ___________.

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3. REFER TO THE NOTES ON SHEETS C-02 AND C-03 FOR ADDITIONAL INFORMATION.

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

DESIGNED BY: C. FERGUSON | DATE: OCTOBER 2018
DWN BY: T. BRASWELL | CKD BY: A. FLETCHER | SOLICITATION NO.:
SUBMITTED BY: HGL | CONTRACT NO.: EP-S7-05-05 TO-0073
PLOT SCALE: 1"=50' | PLOT DATE: | FILE NUMBER: EP9073
SIZE: ANSI D | FILE NAME: C:\Users\cferguson\Documents\0073 Cherokee County ... (Align_Aa)All_Sites.dwg

HGL HydroGeoLogic, Inc.

CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS

EXCAVATION AND RESTORATION PLAN
SEGMENT A, STA 743+50 to 795+50

SHEET IDENTIFICATION
C-Ap

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Align_Aa)All_Sites.dwg
SAVE DATE: Oct 17, 2018 11:40 AM BY: Cferguson PLOT DATE: Oct 17, 2018 11:40 AM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT A - STA 795+50 to 847+50

MATCH TO RIGHT END OF BOTTOM VIEW SHEET C-Ap

MATCH TO LEFT END OF VIEW BELOW

MATCH TO RIGHT END OF VIEW ABOVE

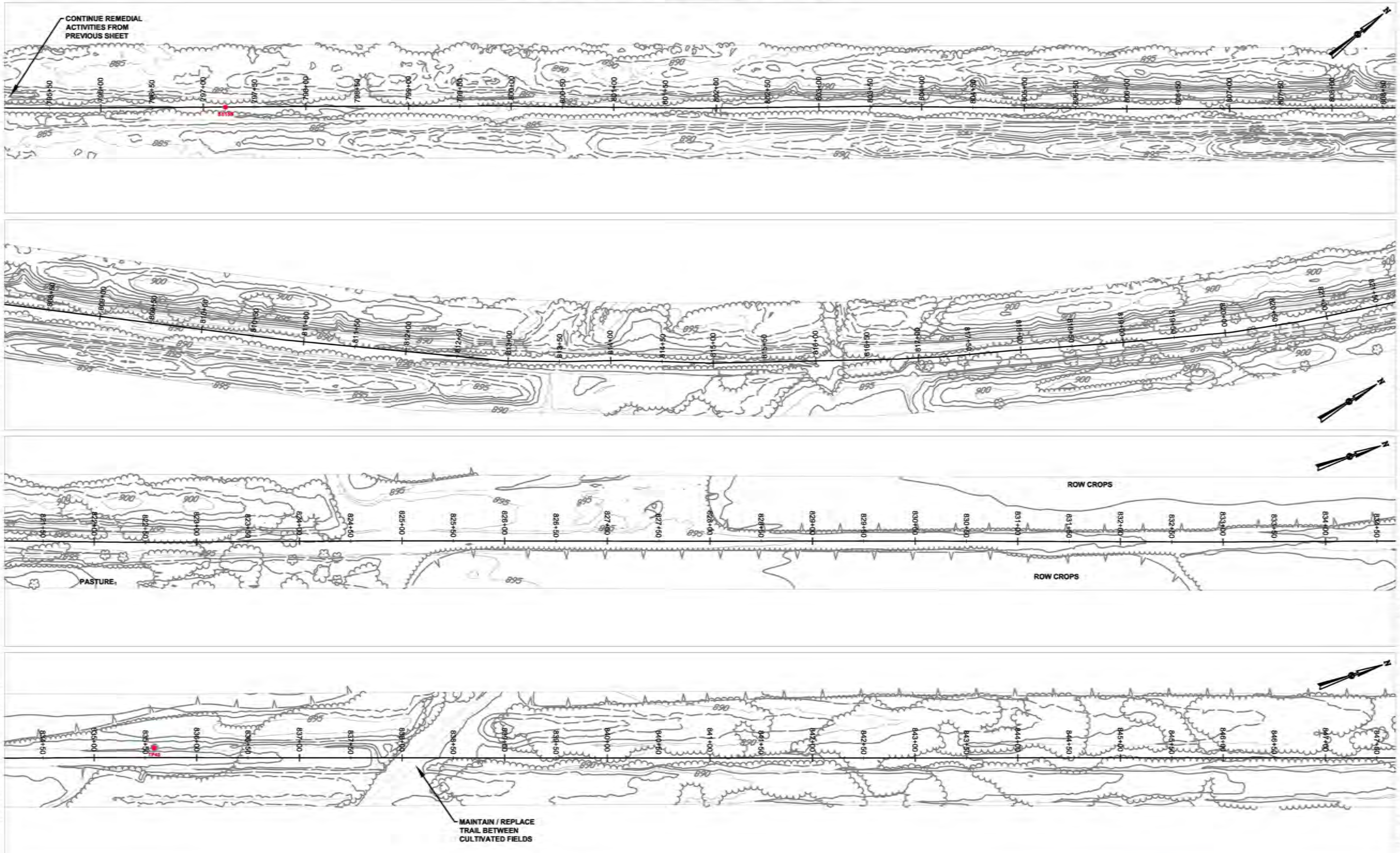
MATCH TO LEFT END OF VIEW BELOW

MATCH TO RIGHT END OF VIEW ABOVE

MATCH TO LEFT END OF VIEW BELOW

MATCH TO RIGHT END OF VIEW ABOVE

MATCH TO LEFT END OF TOP VIEW SHEET C-Ar



AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT ___ RECEIVES STORMWATER RUNOFF FROM _________. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR ____________.

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3. REFER TO THE NOTES ON SHEETS C-02 AND C-03 FOR ADDITIONAL INFORMATION.

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

DESIGNED BY: C. FERGUSON		DATE: OCTOBER 2018
DWN BY: T. BRASWELL	CKD BY: A. FLETCHER	SOLICITATION NO.:
SUBMITTED BY: HGL		CONTRACT NO.: EP-S7-05-05 TO-0073
PLOT SCALE: 1"=50'	PLOT DATE:	FILE NUMBER: EP0073
SIZE: ANSI D	FILE NAME:	

HGL HydroGeoLogic, Inc.

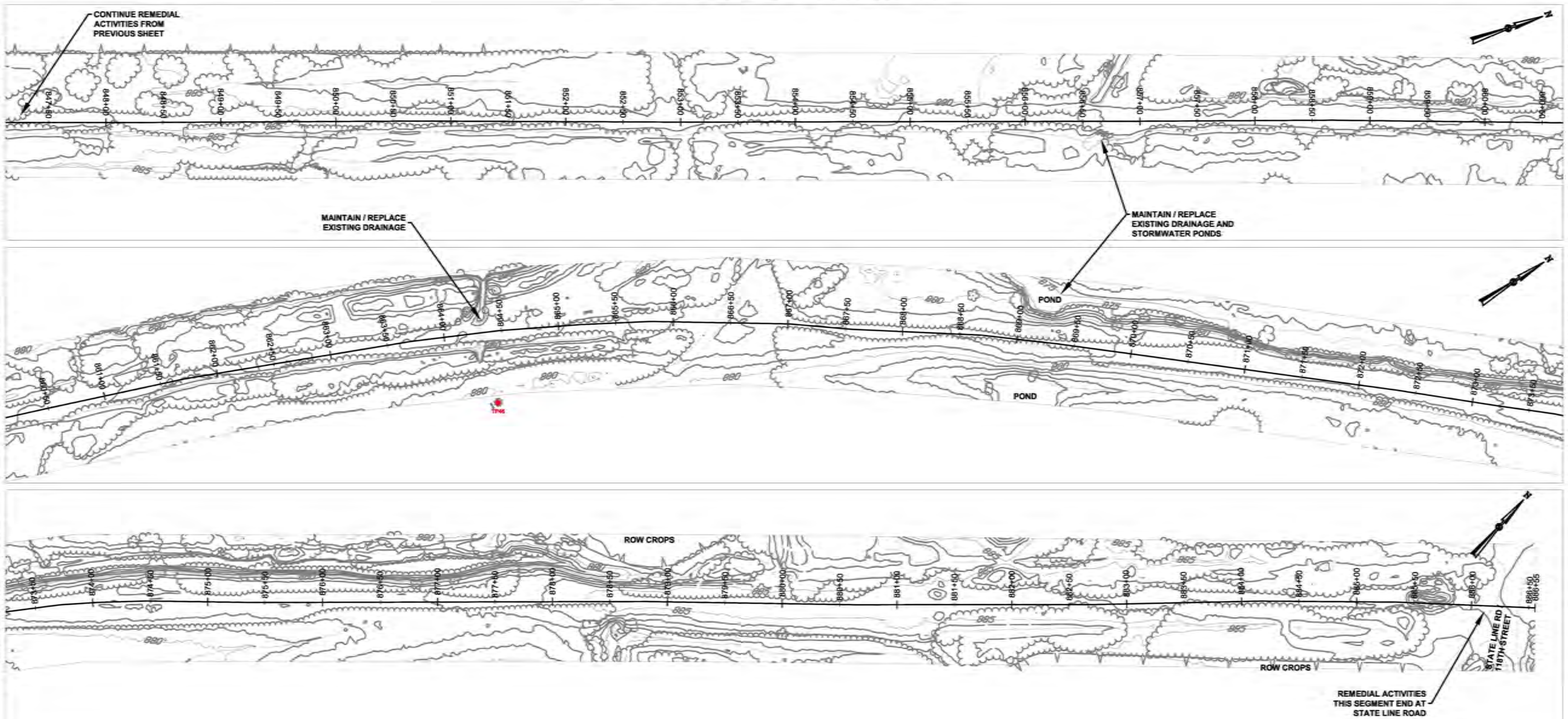
CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS

EXCAVATION AND RESTORATION PLAN
SEGMENT A, STA 795+50 to 847+50

SHEET IDENTIFICATION
C-Aq

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Align_Aa)All_Sites.dwg
SAVE DATE: Oct 17, 2018 11:40 AM BY: Cferguson PLOT DATE: Oct 17, 2018 11:46 AM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT A - STA 847+50 to 886+55



<u>SEGMENT A SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:</u>
<u>(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)</u>

[these notes will be updated for the final version of drawings]

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

DATE: OCTOBER 2018
SOLICITATION NO.:
CONTRACT NO.: EP-S7-05-05 TO-0073
FILE NUMBER: EP0073
DESIGNED BY: C. FERGUSON
DWN BY: T. BRASWELL
CKD BY: A. FLETCHER
SUBMITTED BY: HGL
PLOT SCALE: 1"=50'
PLOT DATE:
SIZE: ANSI D
FILE NAME: C:\Users\cferguson\Documents\0073 Cherokee County...(Align_Aa)All_Sites.dwg

HGL

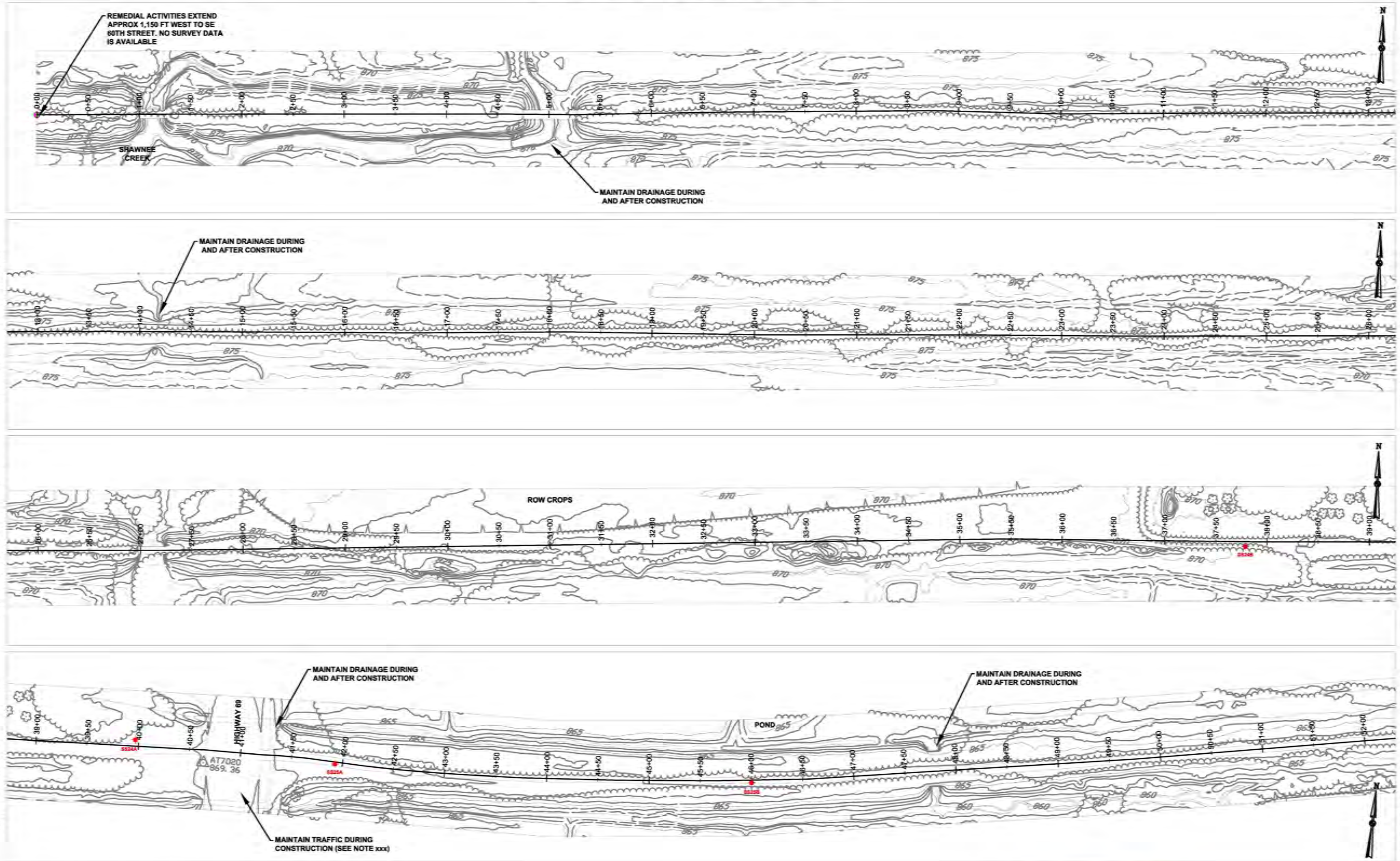
CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS

EXCAVATION AND RESTORATION PLAN
SEGMENT A, STA 847+50 to 886+55

SHEET IDENTIFICATION
C-Ar

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Align_Aa)All_Sites.dwg
SAVE DATE: Oct 26, 2018 1:28 PM BY: Cferguson PLOT DATE: Oct 26, 2018 1:59 PM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT B - STA 0+00 to 52+00



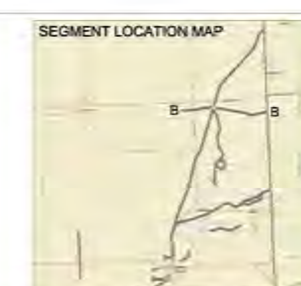
AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT ___ RECEIVES STORMWATER RUNOFF FROM _________. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR ____________.

2. (*DISCUSS ACCESS, IF NEEDED, OR DELETE THIS NOTE*). CONTRACTOR SHALL MEET WITH THE PROPERTY OWNER AND EPA TO ESTABLISH THE LOCATION OF THE TEMPORARY ACCESS ROAD. THE ROAD AND EXISTING CHAT TRAIL SHALL BE REMOVED TO THE LIMITS OF CONSTRUCTION AS PART OF THE SITE RESTORATION ACTIVITIES

3. REFER TO THE NOTES ON SHEETS C-02 AND C-03 FOR ADDITIONAL INFORMATION.

SEGMENT LOCATION MAP



1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

DESIGNED BY: C. FERGUSON
DATE: OCTOBER 2018
DWN BY: T. BRASWELL
CKD BY: A. FLETCHER
SOLICITATION NO.:
SUBMITTED BY: HGL
CONTRACT NO.: EP-S7-05-06 TO-0073
PLOT SCALE: 1"=50'
PLOT DATE:
FILE NUMBER: EP0073
SIZE: ANSI D
FILE NAME: (Align_Ba)All_Sites.dwg

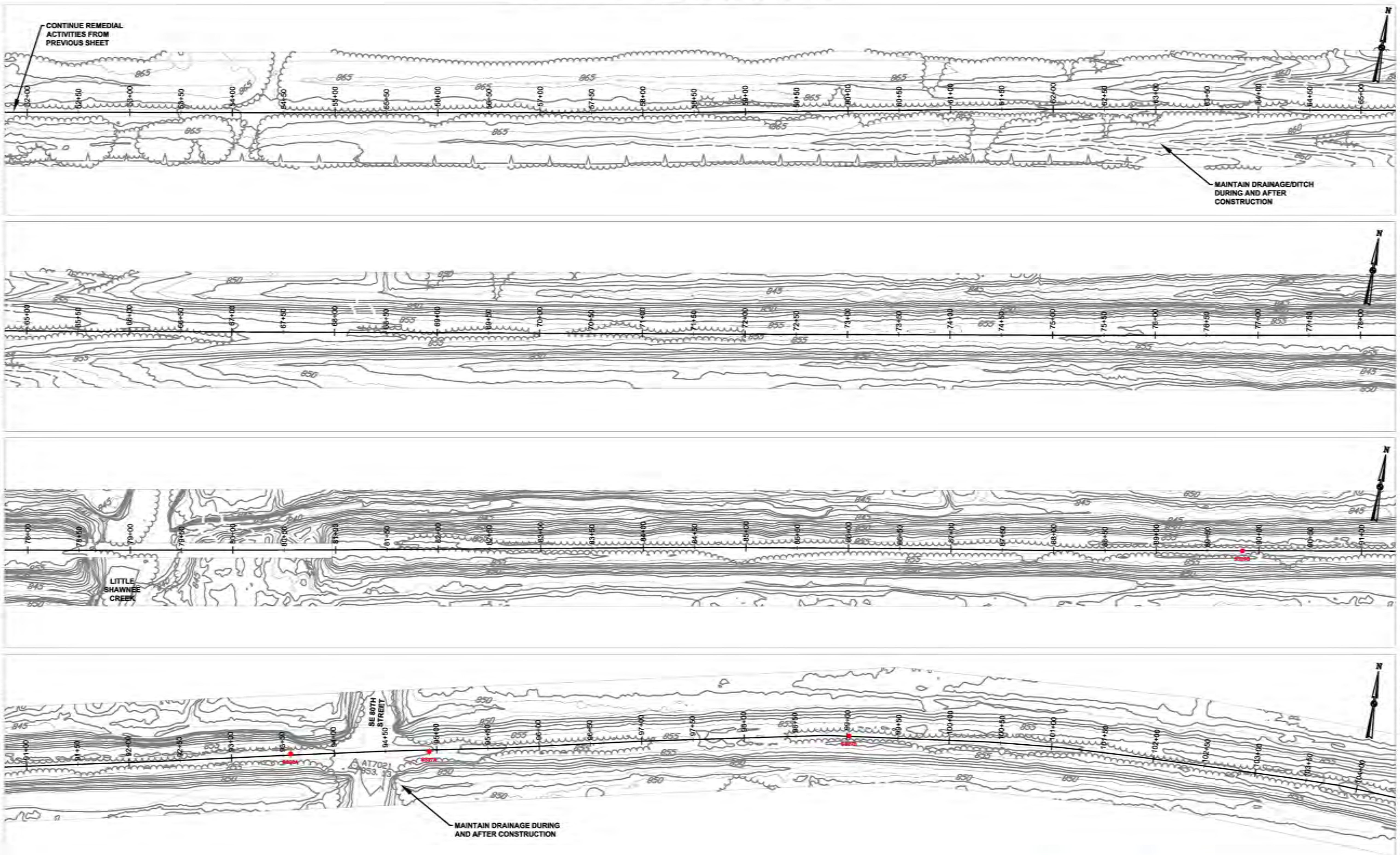
HGL

CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS
EXCAVATION AND RESTORATION PLAN
SEGMENT B, STA 0+00 to 52+00

SHEET IDENTIFICATION
C-Ba

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Align_Ba)All_Sites.dwg
SAVE DATE: Sep 7, 2018 11:49 AM BY: Cferguson PLOT DATE: Oct 17, 2018 1:16 PM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT B - STA 52+00 to 104+00



AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT __ RECEIVES STORMWATER RUNOFF FROM ________. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR ____________.

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SEGMENT LOCATION MAP

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

DESIGNED BY: C. FERGUSON
DWN BY: T. BRASWELL
CKD BY: A. FLETCHER
SUBMITTED BY: HGL
PLOT SCALE: 1"=50'
PLOT DATE:
SIZE: ANSI D
FILE NAME: C:\Users\cferguson\Documents\0073 Cherokee County ... (Align_Ba)All_Sites.dwg
DATE: OCTOBER 2018
SOLICITATION NO.:
CONTRACT NO.: EP-S7-05-05 TO-0073
FILE NUMBER: EP0073

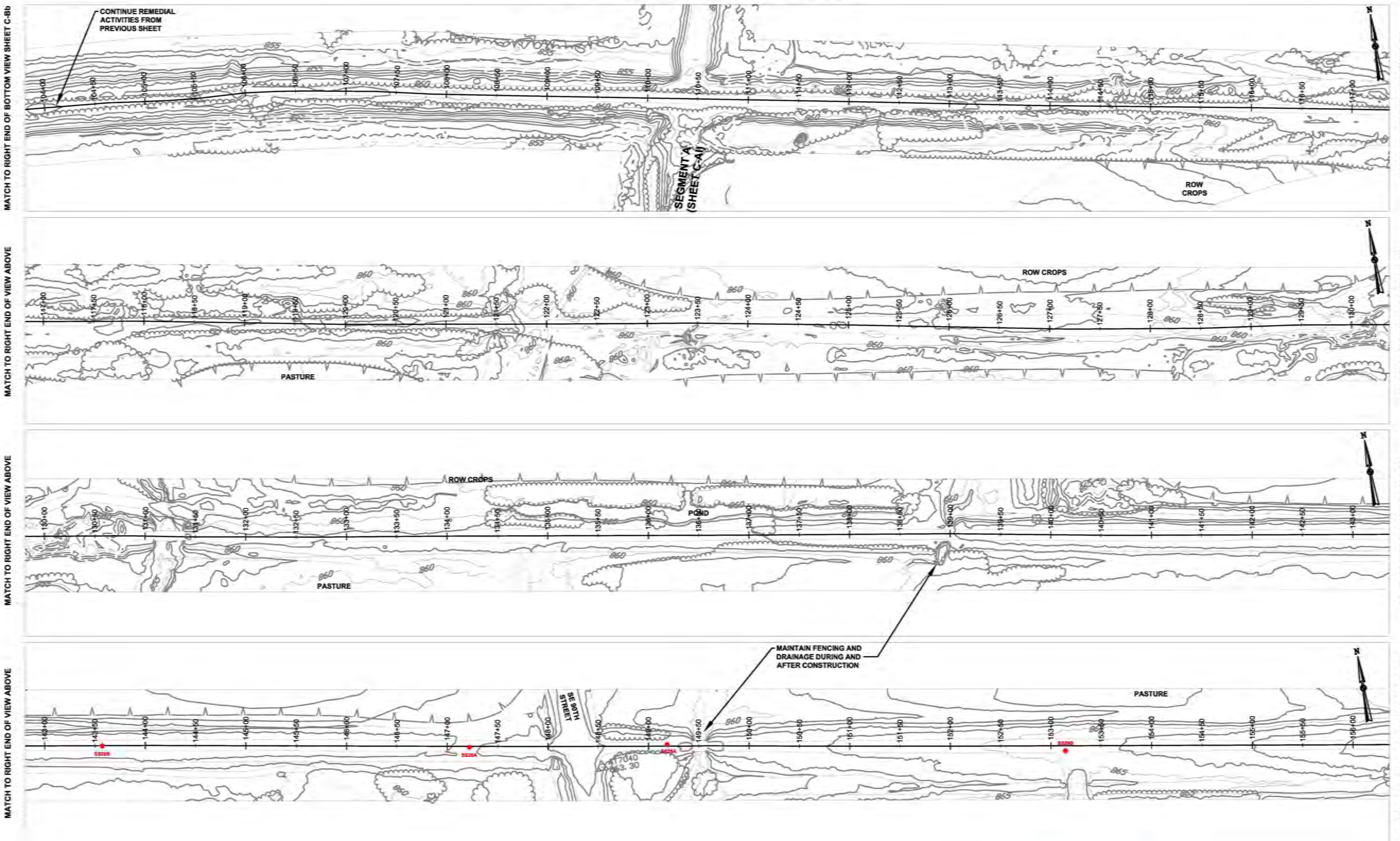
HGL

CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS
EXCAVATION AND RESTORATION PLAN
SEGMENT B, STA 52+00 to 104+00

SHEET IDENTIFICATION
C-Bb

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Align_Ba)All_Sites.dwg
SAVE DATE: Sep 7, 2018 11:49 AM BY: Cferguson PLOT DATE: Oct 17, 2018 1:44 PM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT B - STA 104+00 to 156+00



AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT __ RECEIVES STORMWATER RUNOFF FROM ________. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR ___________.

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3. REFER TO THE NOTES ON SHEETS C-02 AND C-03 FOR ADDITIONAL INFORMATION.

SEGMENT LOCATION MAP

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

DESIGNED BY: C. FERGUSON
DATE: OCTOBER 2018
DWN BY: T. BRASWELL
CKD BY: A. FLETCHER
SOLICITATION NO.:
SUBMITTED BY: HGL
CONTRACT NO.: EP-S7-05-05 TO-0073
PLOT SCALE: 1"=50'
PLOT DATE:
FILE NUMBER: EP0073
SIZE: ANSI D
FILE NAME: C:\Users\cferguson\Documents\0073 Cherokee County (Align_Ba)All_Sites.dwg

HGL

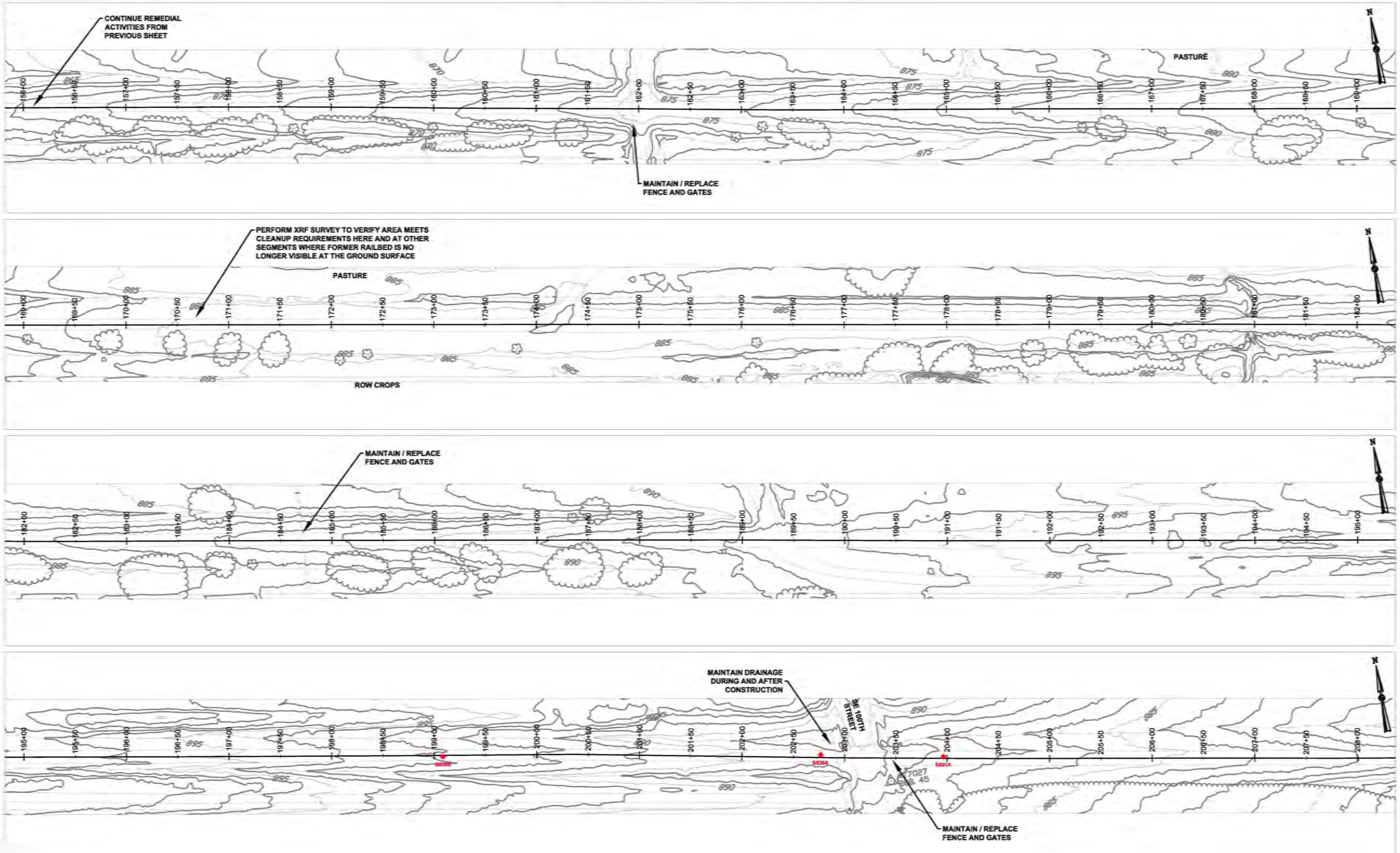
CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS

EXCAVATION AND RESTORATION PLAN
SEGMENT B, STA 0+104 to 156+00

SHEET IDENTIFICATION
C-Bc

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Align_Ba)All_Sites.dwg
SAVE DATE: Sep 7, 2018 11:49 AM BY: Cferguson PLOT DATE: Oct 17, 2018 1:52 PM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT B - STA 156+00 to 208+00



SEGMENT A SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

[these notes will be updated for the final version of drawings]

SEGMENT LOCATION MAP

1" = 50'

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

DESIGNED BY: C. FERGUSON
DWN BY: T. BRASWELL
CKD BY: A. FLETCHER
SUBMITTED BY: HGL
DATE: OCTOBER 2018
SOLICITATION NO.:
CONTRACT NO.: EP-S7-05-05 TO-0073
FILE NUMBER: EP0073
PLOT SCALE: 1"=50'
PLOT DATE:
SIZE: ANSI D

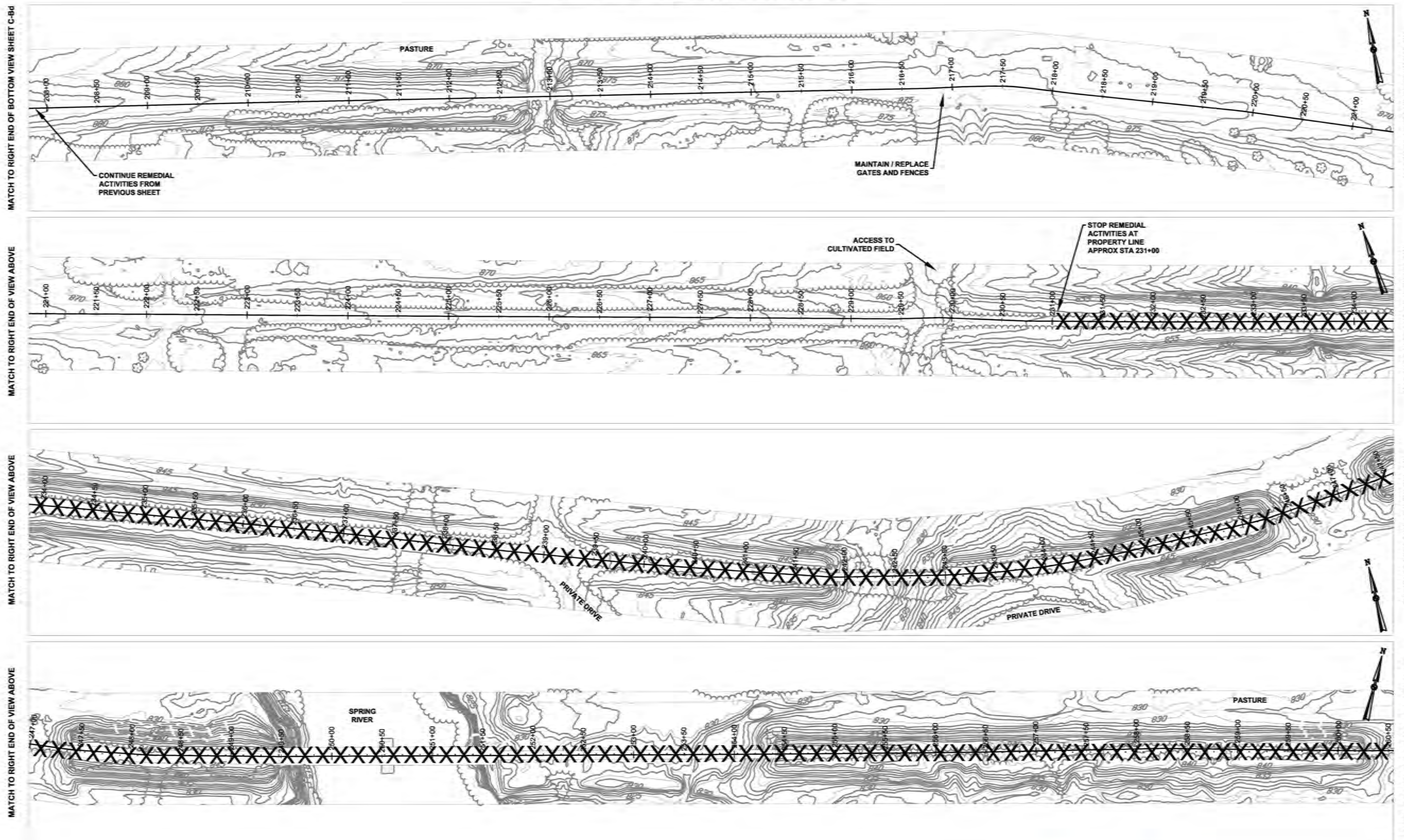
CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS

EXCAVATION AND RESTORATION PLAN
SEGMENT B, STA 156+00 to 208+00

SHEET IDENTIFICATION
C-Bd

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Align_Ba)All_Sites.dwg
SAVE DATE: Oct 23, 2018 3:25 PM BY: Cferguson PLOT DATE: Oct 26, 2018 2:24 PM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT B - STA 208+00 to 260+50



AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT __ RECEIVES STORMWATER RUNOFF FROM ________. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR ___________.

2. (*DISCUSS ACCESS, IF NEEDED, OR DELETE THIS NOTE*). CONTRACTOR SHALL MEET WITH THE PROPERTY OWNER AND EPA TO ESTABLISH THE LOCATION OF THE TEMPORARY ACCESS ROAD. THE ROAD AND EXISTING CHAT TRAIL SHALL BE REMOVED TO THE LIMITS OF CONSTRUCTION AS PART OF THE SITE RESTORATION ACTIVITIES

3. REFER TO THE NOTES ON SHEETS C-02 AND C-03 FOR ADDITIONAL INFORMATION.

SEGMENT LOCATION MAP

1" = 50'

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

DESIGNED BY: C. FERGUSON		DATE: OCTOBER 2018
DWN BY: T. BRASWELL	CKD BY: A. FLETCHER	SOLICITATION NO.:
SUBMITTED BY: HGL		CONTRACT NO.: EP-S7-05-05 TO-0073
PLOT SCALE: 1"=50'	PLOT DATE:	FILE NUMBER: EP0073
SIZE: ANSI D	FILE NAME:	

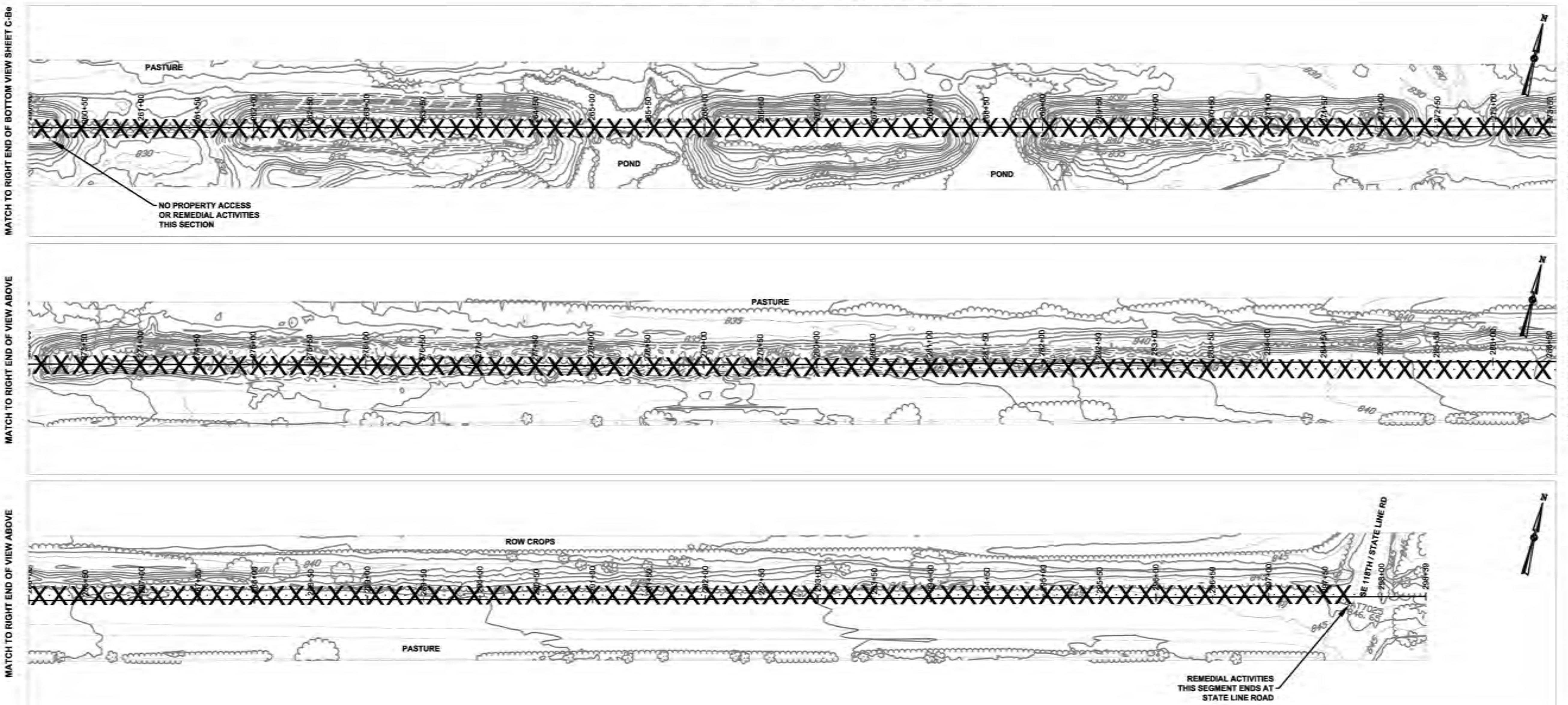
CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS

EXCAVATION AND RESTORATION PLAN
SEGMENT B, STA 208+00 to 260+50

SHEET IDENTIFICATION
C-Be

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Align_Ba)All_Sites.dwg
SAVE DATE: Sep 7, 2018 11:49 AM BY: Cferguson PLOT DATE: Oct 17, 2018 1:59 PM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT B - STA 260+50 to 298+00



SEGMENT A SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

[these notes will be updated for the final version of drawings]

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

DESIGNED BY: C. FERGUSON		DATE: OCTOBER 2018
DWN BY: T. BRASWELL	CKD BY: A. FLETCHER	SOLICITATION NO.:
SUBMITTED BY: HGL		CONTRACT NO.: EP-S7-05-05 TO-0073
PLOT SCALE: 1"=50'	PLOT DATE:	FILE NUMBER: EP0073
SIZE: ANSI D	FILE NAME: C:\Users\cferguson\Documents\0073 Cherokee County ...\(Align_Ba)All_Sites.dwg	

HGL

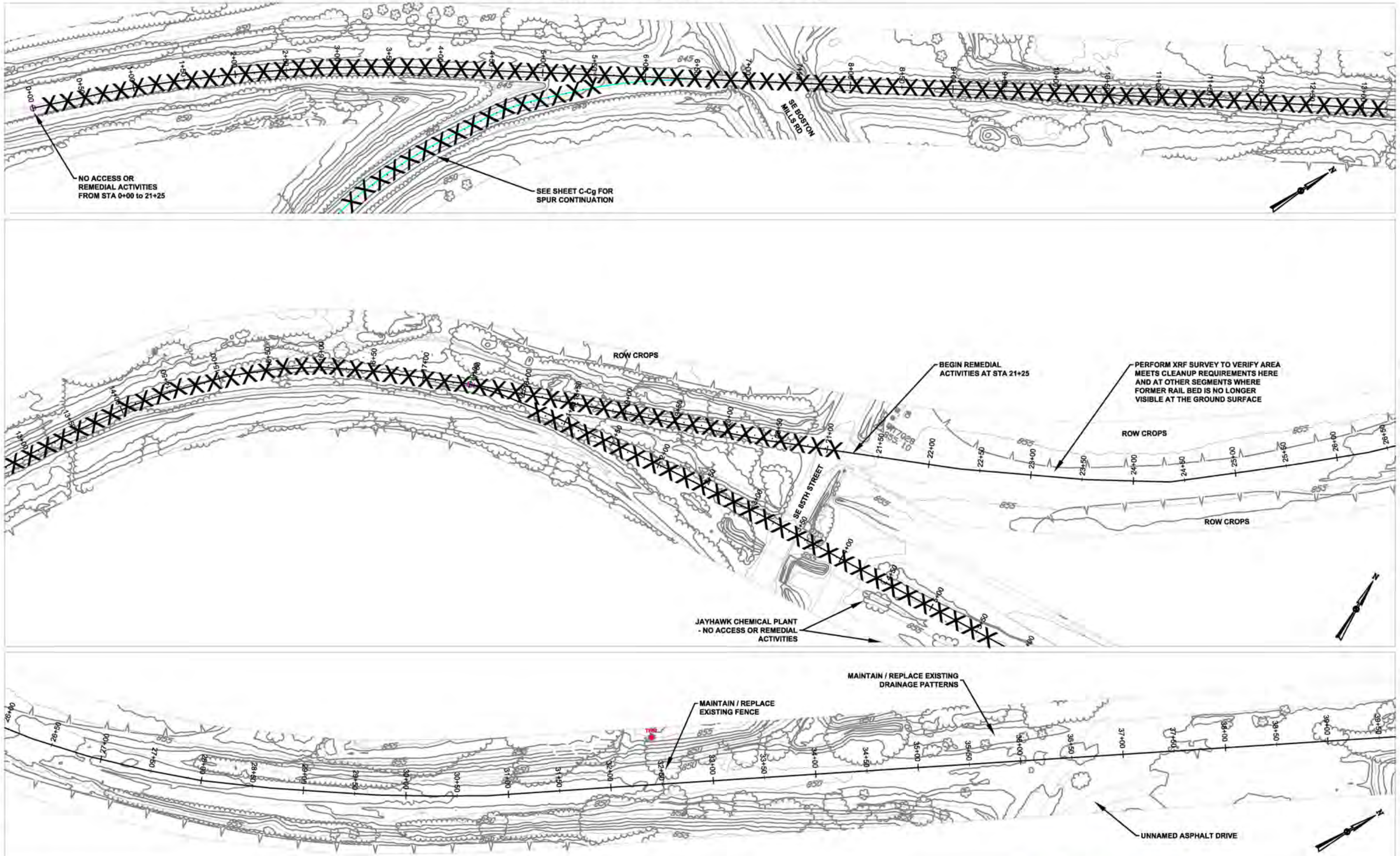
CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS

EXCAVATION AND RESTORATION PLAN
SEGMENT B, STA 260+50 to 298+00

SHEET IDENTIFICATION
C-Bf

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Align_Ba)All_Sites.dwg
SAVE DATE: Oct 26, 2018 2:28 PM BY: Cferguson PLOT DATE: Oct 26, 2018 2:28 PM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT C - STA 0+00 to 39+50



AREA-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. THIS PORTION OF SEGMENT C INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND/OR FORMER RAILROAD EMBANKMENT MATERIALS . THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL.

2. (*DISCUSS ACCESS, IF NEEDED, OR DELETE THIS NOTE*). CONTRACTOR SHALL MEET WITH THE PROPERTY OWNER AND EPA TO ESTABLISH THE LOCATION OF ACCESS TO AND FROM THE SITE.

3. REFER TO THE NOTES ON SHEETS G-02 AND G-03 FOR ADDITIONAL INFORMATION.

SEGMENT LOCATION MAP

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

HGL

DESIGNED BY: C. FERGUSON		DATE: OCTOBER 2018
DWN BY: T. BRASWELL	CKD BY: A. FLETCHER	SOLICITATION NO.:
SUBMITTED BY: HGL		CONTRACT NO.: EP-S7-05-05 TO-0073
PLOT SCALE: 1"=50'	PLOT DATE:	FILE NUMBER: EP8073
SIZE: ANSI D	FILE NAME: C:\Users\CFERGU~1\AppData\Local\Temp\Aligns_C-(All_Sites.dwg	

CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS
EXCAVATION AND RESTORATION PLAN
SEGMENT C, STA 0+00 to 39+50

SHEET IDENTIFICATION
C-Ca

DWG FILE: C:\Users\CFERGU~1\AppData\Local\Temp\Aligns_C-(All_Sites.dwg
SAVE DATE: Oct 26, 2018 2:31 PM BY: Cferguson PLOT DATE: Oct 26, 2018 2:37 PM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT C - STA 39+50 to 79+00

MATCH TO RIGHT END OF BOTTOM VIEW SHEET C-Ca

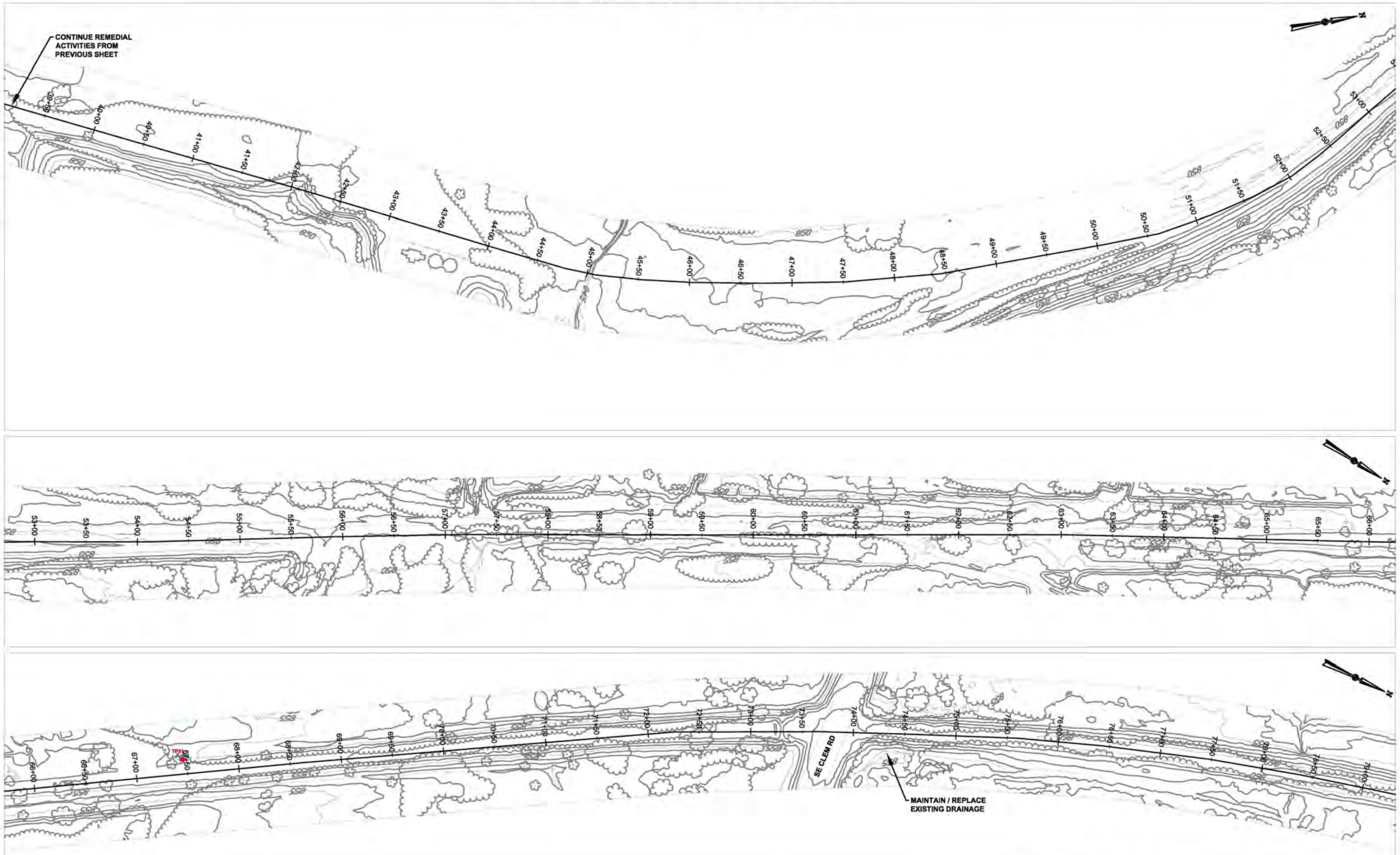
MATCH TO LEFT END OF VIEW BELOW

MATCH TO RIGHT END OF VIEW ABOVE

MATCH TO LEFT END OF VIEW BELOW

MATCH TO RIGHT END OF VIEW ABOVE

MATCH TO LEFT END OF TOP VIEW SHEET C-Cc



AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT ___ RECEIVES STORMWATER RUNOFF FROM ________. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR ___________.

2. (*DISCUSS ACCESS, IF NEEDED, OR DELETE THIS NOTE*). CONTRACTOR SHALL MEET WITH THE PROPERTY OWNER AND EPA TO ESTABLISH THE LOCATION OF THE TEMPORARY ACCESS ROAD. THE ROAD AND EXISTING CHAT TRAIL SHALL BE REMOVED TO THE LIMITS OF CONSTRUCTION AS PART OF THE SITE RESTORATION ACTIVITIES

3. REFER TO THE NOTES ON SHEETS C-02 AND C-03 FOR ADDITIONAL INFORMATION.

SEGMENT LOCATION MAP

1" = 50'

25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

HGL

DESIGNED BY: C. FERGUSON		DATE: OCTOBER 2018
DWN BY: T. BRASWELL	CKD BY: A. FLETCHER	SOLICITATION NO.:
SUBMITTED BY: HGL		CONTRACT NO.: EP-S7-05-05 TO-0073
PLOT SCALE: 1"=50'	PLOT DATE:	FILE NUMBER: EP8073
SIZE: ANSI D	FILE NAME:	

CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS
EXCAVATION AND RESTORATION PLAN
SEGMENT C, STA 39+50 to 79+00

SHEET IDENTIFICATION
C-Cb

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Aligns_C-)\All_Sites.dwg
SAVE DATE: Sep 7, 2018 3:16 PM BY: Cferguson PLOT DATE: Oct 17, 2018 2:15 PM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT C - STA 79+00 to 131+00

MATCH TO RIGHT END OF BOTTOM VIEW SHEET C-Cb

MATCH TO LEFT END OF VIEW BELOW

MATCH TO RIGHT END OF VIEW ABOVE

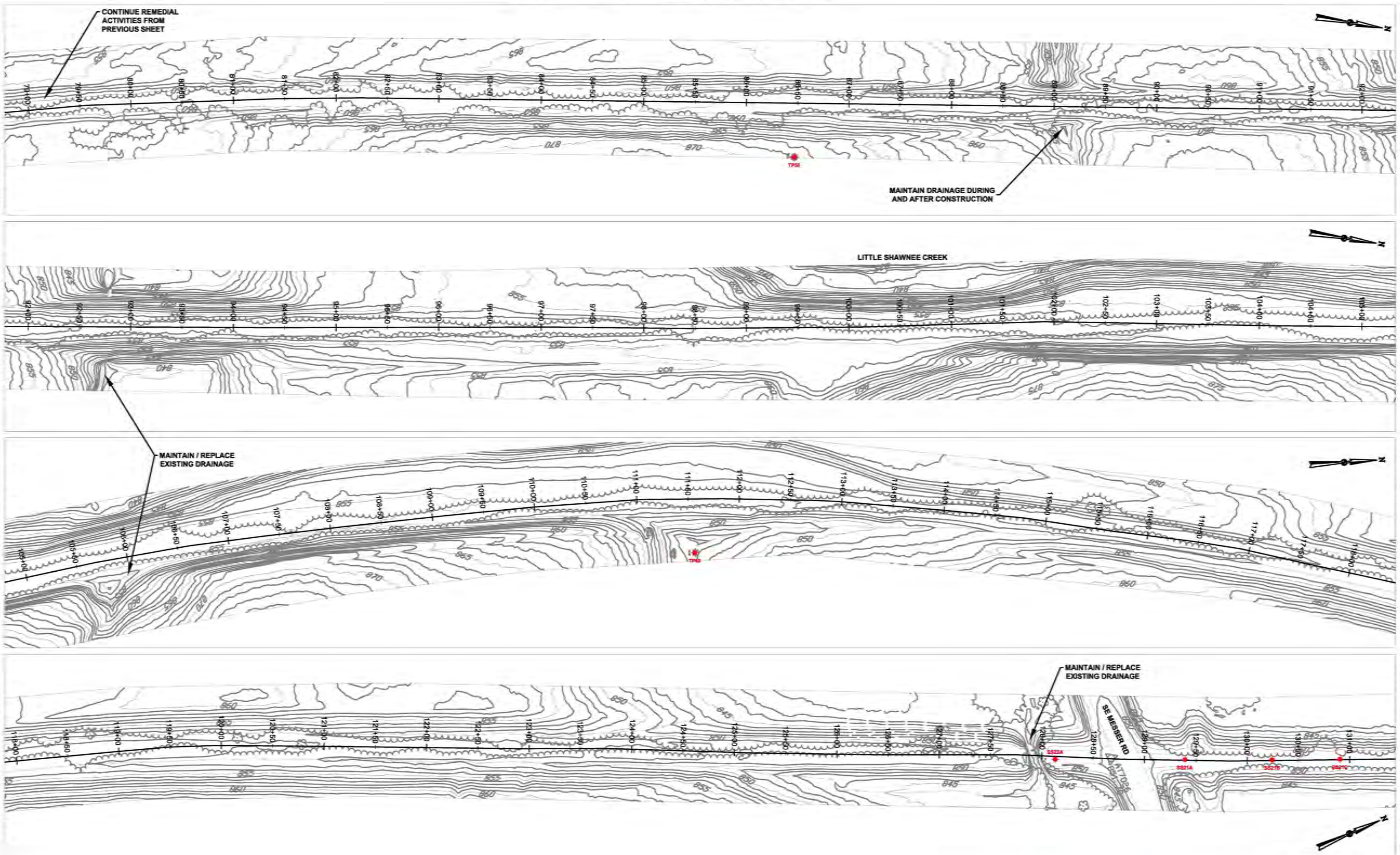
MATCH TO LEFT END OF VIEW BELOW

MATCH TO RIGHT END OF VIEW ABOVE

MATCH TO LEFT END OF VIEW BELOW

MATCH TO RIGHT END OF VIEW ABOVE

MATCH TO LEFT END OF TOP VIEW SHEET C-Cd



SEGMENT A SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

[these notes will be updated for the final version of drawings]

SEGMENT LOCATION MAP

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

HGL

DESIGNED BY: C. FERGUSON
DATE: OCTOBER 2018
DWN BY: T. BRASWELL
CKD BY: A. FLETCHER
SOLICITATION NO.:
SUBMITTED BY: HGL
CONTRACT NO.: EP-S7-05-05 TO-0073
PLOT SCALE: 1"=50'
PLOT DATE:
FILE NUMBER: EP8073
SIZE: ANSI D
FILE NAME: C:\Users\CFERGU~1\AppData\Local\Temp\(Aligns_C-)All_Sites.dwg

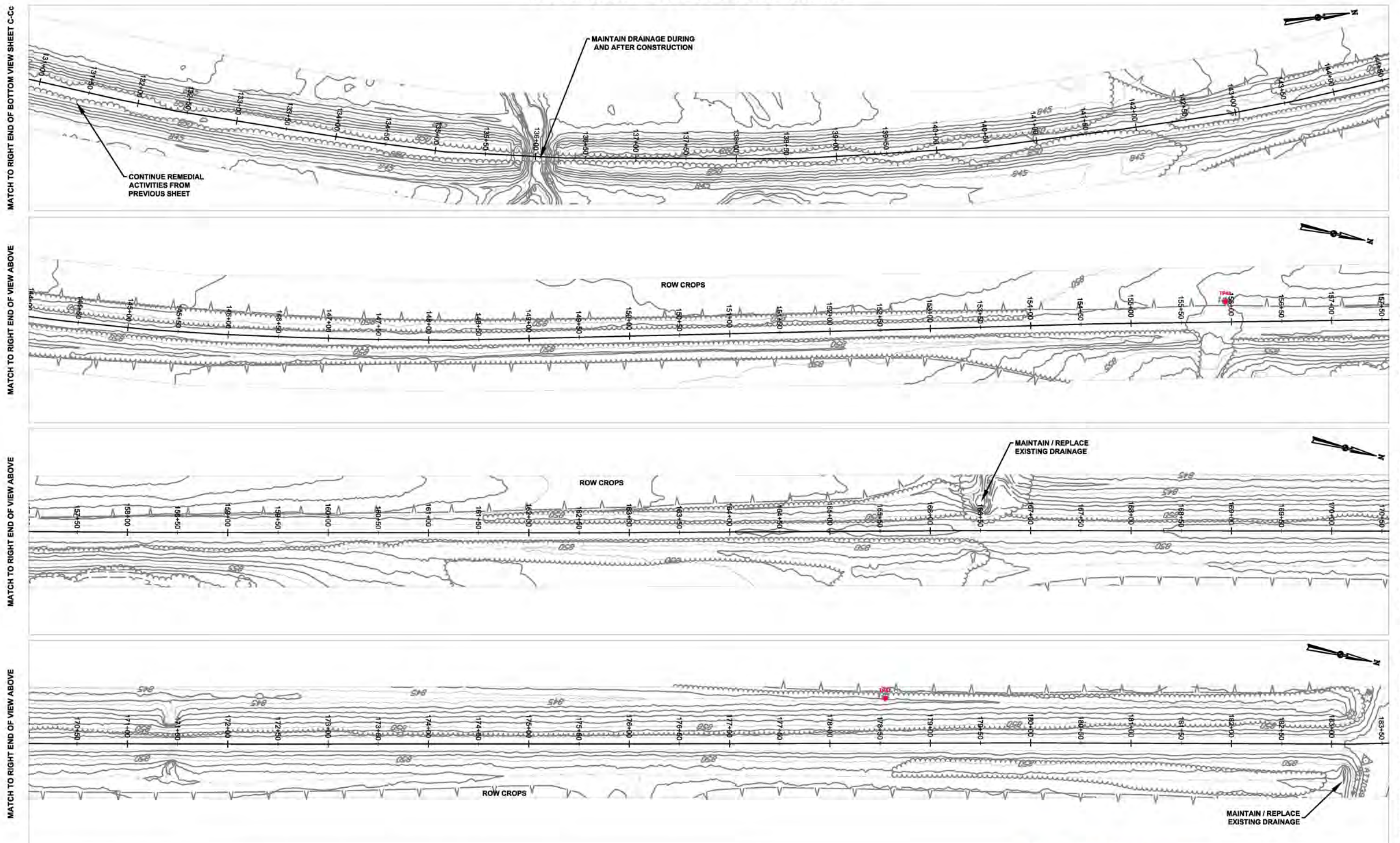
CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS

EXCAVATION AND RESTORATION PLAN
SEGMENT C, STA 79+00 to 131+00

SHEET IDENTIFICATION
C-Cc

DWG FILE: C:\Users\CFERGU~1\AppData\Local\Temp\(Aligns_C-)All_Sites.dwg BY: Ferguson, Chad
SAVE DATE: Oct 26, 2018 2:31 PM BY: Cferguson PLOT DATE: Oct 26, 2018 2:47 PM
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT C - STA 131+00 to 183+50



AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT ___ RECEIVES STORMWATER RUNOFF FROM ________. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR ___________.

2. (*DISCUSS ACCESS, IF NEEDED, OR DELETE THIS NOTE*). CONTRACTOR SHALL MEET WITH THE PROPERTY OWNER AND EPA TO ESTABLISH THE LOCATION OF THE TEMPORARY ACCESS ROAD. THE ROAD AND EXISTING CHAT TRAIL SHALL BE REMOVED TO THE LIMITS OF CONSTRUCTION AS PART OF THE SITE RESTORATION ACTIVITIES

3. REFER TO THE NOTES ON SHEETS C-02 AND C-03 FOR ADDITIONAL INFORMATION.

SEGMENT LOCATION MAP

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

DESIGNED BY: C. FERGUSON	DATE: OCTOBER 2018
DWN BY: T. BRASWELL / CKD BY: A. FLETCHER	SOLICITATION NO.:
SUBMITTED BY: HGL	CONTRACT NO.: EP-S7-05-05 TO-0073
PLOT SCALE: 1"=50' / PLOT DATE:	FILE NUMBER: EP8073
SIZE: ANSI D / FILE NAME: C:\Users\cferguson\Documents\0073 Cherokee County\Aligns_C-)All_Sites.dwg	

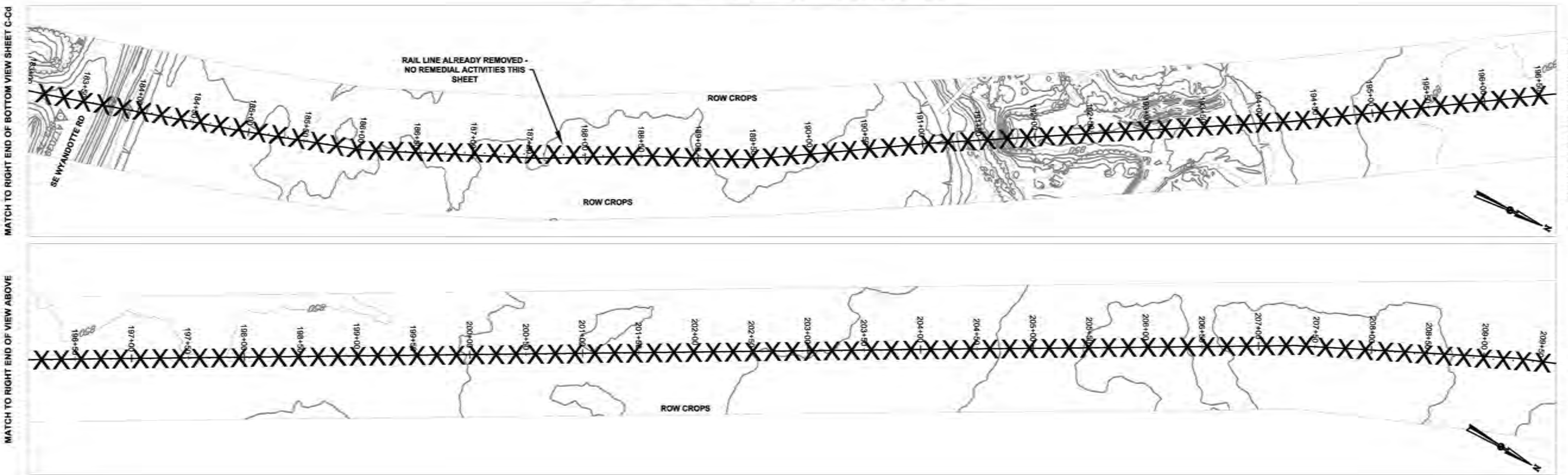
HGL

CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS
EXCAVATION AND RESTORATION PLAN
SEGMENT C, STA 131+00 to 183+50

SHEET IDENTIFICATION
C-Cd

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Aligns_C-)All_Sites.dwg
SAVE DATE: Sep 7, 2018 3:16 PM BY: Cferguson PLOT DATE: Oct 17, 2018 2:20 PM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT C - STA 183+50 to 209+50



AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT __ RECEIVES STORMWATER RUNOFF FROM ________. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR __________.

2. (*DISCUSS ACCESS, IF NEEDED, OR DELETE THIS NOTE*). CONTRACTOR SHALL MEET WITH THE PROPERTY OWNER AND EPA TO ESTABLISH THE LOCATION OF THE TEMPORARY ACCESS ROAD. THE ROAD AND EXISTING CHAT TRAIL SHALL BE REMOVED TO THE LIMITS OF CONSTRUCTION AS PART OF THE SITE RESTORATION ACTIVITIES

3. REFER TO THE NOTES ON SHEETS C-02 AND C-03 FOR ADDITIONAL INFORMATION.

SEGMENT LOCATION MAP

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

DESIGNED BY: C. FERGUSON
DWN BY: T. BRASWELL
CKD BY: A. FLETCHER
SUBMITTED BY: HGL
PLOT SCALE: 1"=50'
PLOT DATE:
SIZE: ANSI D
DATE: OCTOBER 2018
SOLICITATION NO.:
CONTRACT NO.: EP-S7-05-05 TO-0073
FILE NUMBER: EP0073
FILE NAME: C:\Users\cferguson\Documents\0073 Cherokee County ... (Aligns_C-I)All_Sites.dwg

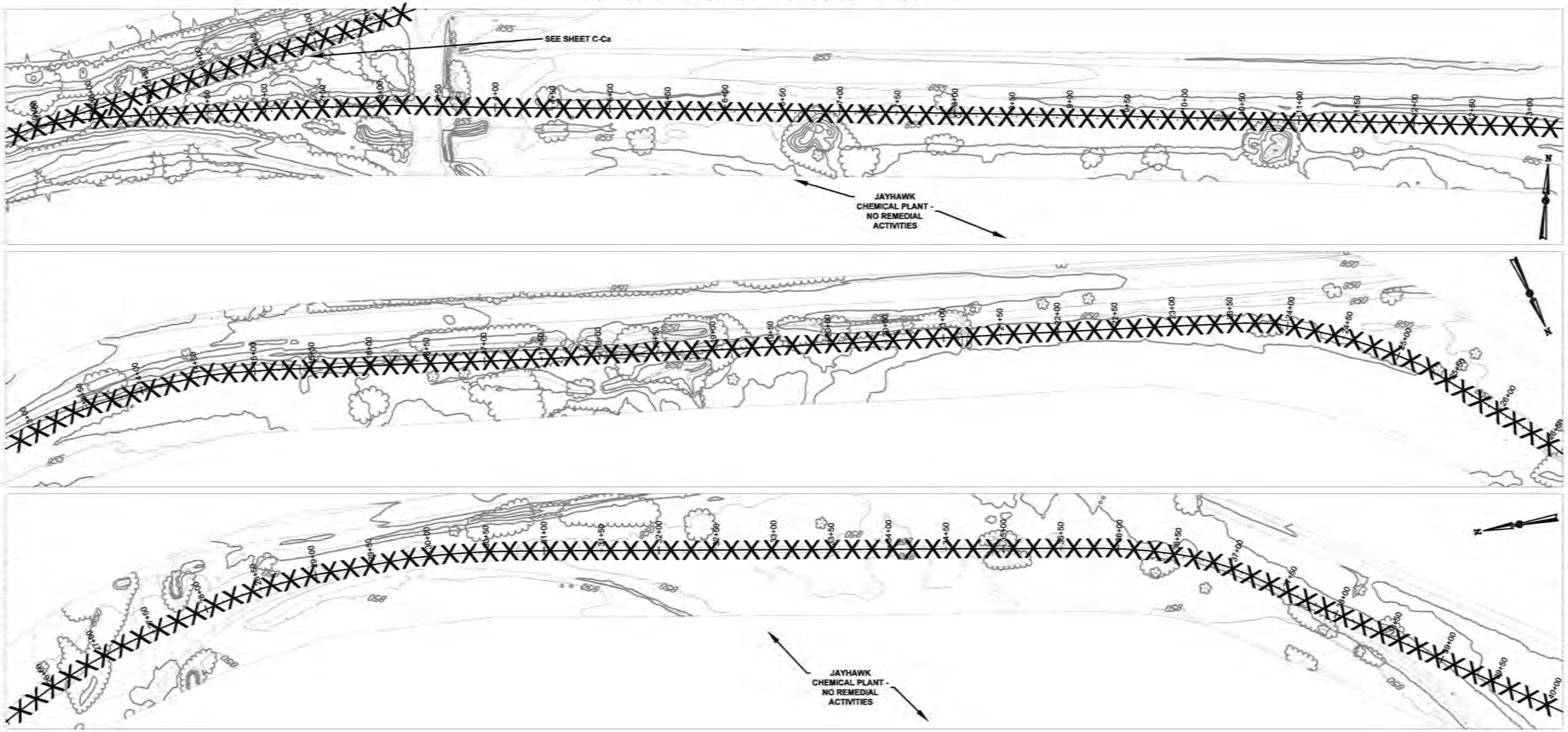
HGL

CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS
EXCAVATION AND RESTORATION PLAN
SEGMENT C, STA 183+50 to 209+50

SHEET IDENTIFICATION
C-Ce

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Aligns_C-I)All_Sites.dwg
SAVE DATE: Sep 7, 2018 3:16 PM BY: Cferguson PLOT DATE: Oct 17, 2018 2:25 PM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT C - STA 0+00 to 40+00



AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT ___ RECEIVES STORMWATER RUNOFF FROM ________. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR ___________.

2. (*DISCUSS ACCESS, IF NEEDED, OR DELETE THIS NOTE*). CONTRACTOR SHALL MEET WITH THE PROPERTY OWNER AND EPA TO ESTABLISH THE LOCATION OF THE TEMPORARY ACCESS ROAD. THE ROAD AND EXISTING CHAT TRAIL SHALL BE REMOVED TO THE LIMITS OF CONSTRUCTION AS PART OF THE SITE RESTORATION ACTIVITIES

3. REFER TO THE NOTES ON SHEETS C-02 AND C-03 FOR ADDITIONAL INFORMATION.

SEGMENT LOCATION MAP

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

DESIGNED BY: C. FERGUSON		DATE: OCTOBER 2018
DWN BY: T. BRASWELL	CKD BY: A. FLETCHER	SOLICITATION NO.:
SUBMITTED BY: HGL		CONTRACT NO.: EP-S7-05-05 TO-0073
PLOT SCALE: 1"=50'	PLOT DATE:	FILE NUMBER: EP0073
SIZE: ANSI D	FILE NAME: C:\Users\cferguson\Documents\0073 Cherokee County... (Aligns_C-I)All_Sites.dwg	

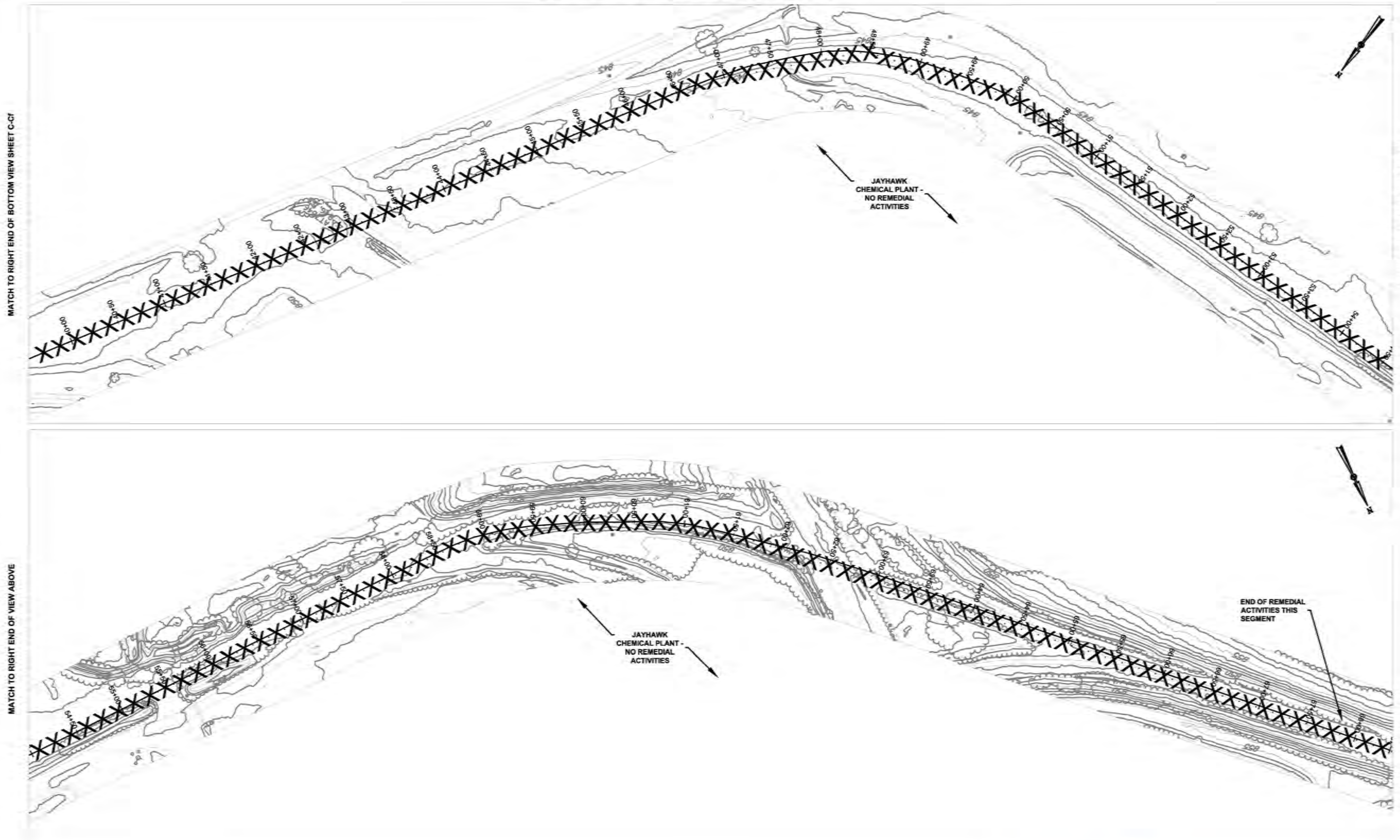
HGL

CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS
EXCAVATION AND RESTORATION PLAN
SEGMENT C, STA 0+00 to 40+00

SHEET IDENTIFICATION
C-Cf

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Aligns_C-I)All_Sites.dwg
SAVE DATE: Oct 26, 2018 2:55 PM BY: Cferguson PLOT DATE: Oct 26, 2018 2:55 PM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT C - STA 40+00 to 68+00



AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT ___ RECEIVES STORMWATER RUNOFF FROM ________. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR ___________.

2. (*DISCUSS ACCESS, IF NEEDED, OR DELETE THIS NOTE*). CONTRACTOR SHALL MEET WITH THE PROPERTY OWNER AND EPA TO ESTABLISH THE LOCATION OF THE TEMPORARY ACCESS ROAD. THE ROAD AND EXISTING CHAT TRAIL SHALL BE REMOVED TO THE LIMITS OF CONSTRUCTION AS PART OF THE SITE RESTORATION ACTIVITIES

3. REFER TO THE NOTES ON SHEETS C-02 AND C-03 FOR ADDITIONAL INFORMATION.

SEGMENT LOCATION MAP

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

DESIGNED BY: C. FERGUSON		DATE: OCTOBER 2018
DWN BY: T. BRASWELL	CKD BY: A. FLETCHER	SOLICITATION NO.:
SUBMITTED BY: HGL		CONTRACT NO.: EP-S7-05-06 TO-0073
PLOT SCALE: 1"=50'	PLOT DATE:	FILE NUMBER: EP9073
SIZE: ANSI D	FILE NAME:	(Aligns_C-I)All_Sites.dwg

HGL

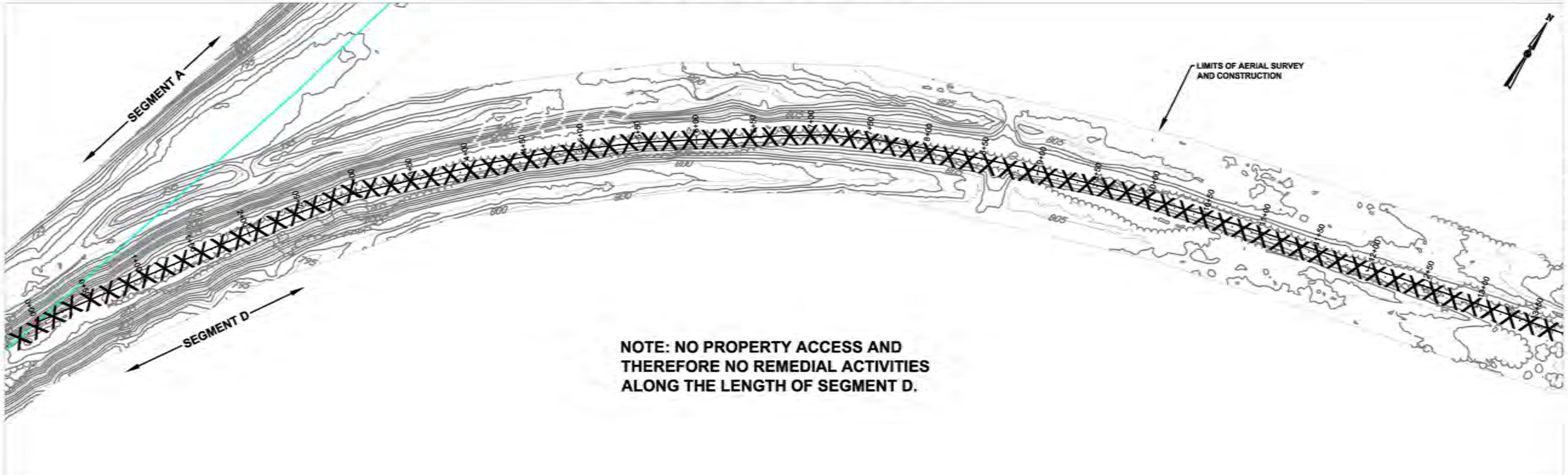
CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS

EXCAVATION AND RESTORATION PLAN
SEGMENT C, STA 40+00 to 68+00

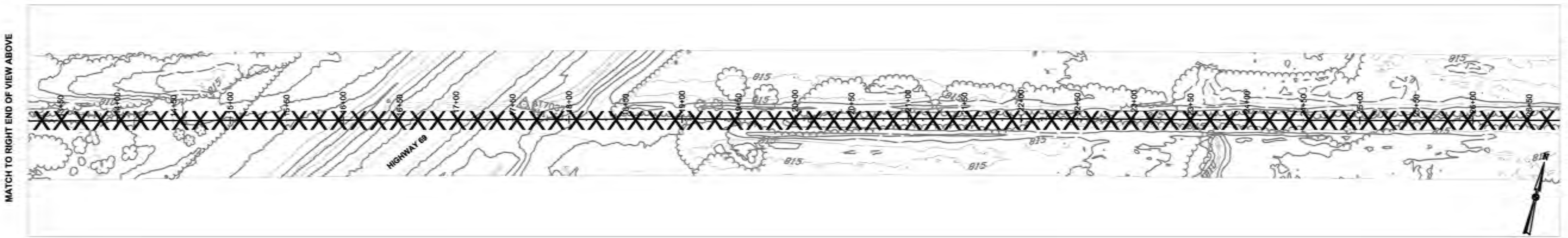
SHEET IDENTIFICATION
C-Cg

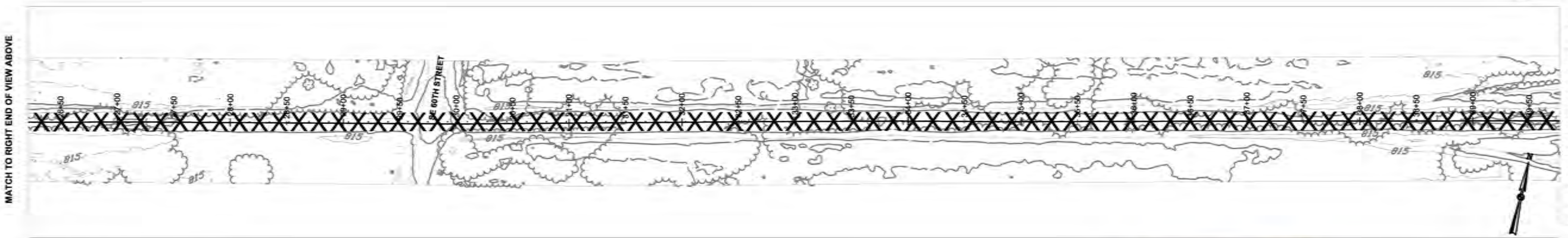
DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Aligns_C-I)All_Sites.dwg
SAVE DATE: Oct 26, 2018 2:57 PM BY: Cferguson PLOT DATE: Oct 26, 2018 2:58 PM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT D - STA 0+00 to 39+50



NOTE: NO PROPERTY ACCESS AND THEREFORE NO REMEDIAL ACTIVITIES ALONG THE LENGTH OF SEGMENT D.





AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT ___ RECEIVES STORMWATER RUNOFF FROM ________. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR ___________.

2. (*DISCUSS ACCESS, IF NEEDED, OR DELETE THIS NOTE*). CONTRACTOR SHALL MEET WITH THE PROPERTY OWNER AND EPA TO ESTABLISH THE LOCATION OF THE TEMPORARY ACCESS ROAD. THE ROAD AND EXISTING CHAT TRAIL SHALL BE REMOVED TO THE LIMITS OF CONSTRUCTION AS PART OF THE SITE RESTORATION ACTIVITIES

3. REFER TO THE NOTES ON SHEETS C-02 AND C-03 FOR ADDITIONAL INFORMATION.

SEGMENT LOCATION MAP

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

HGL

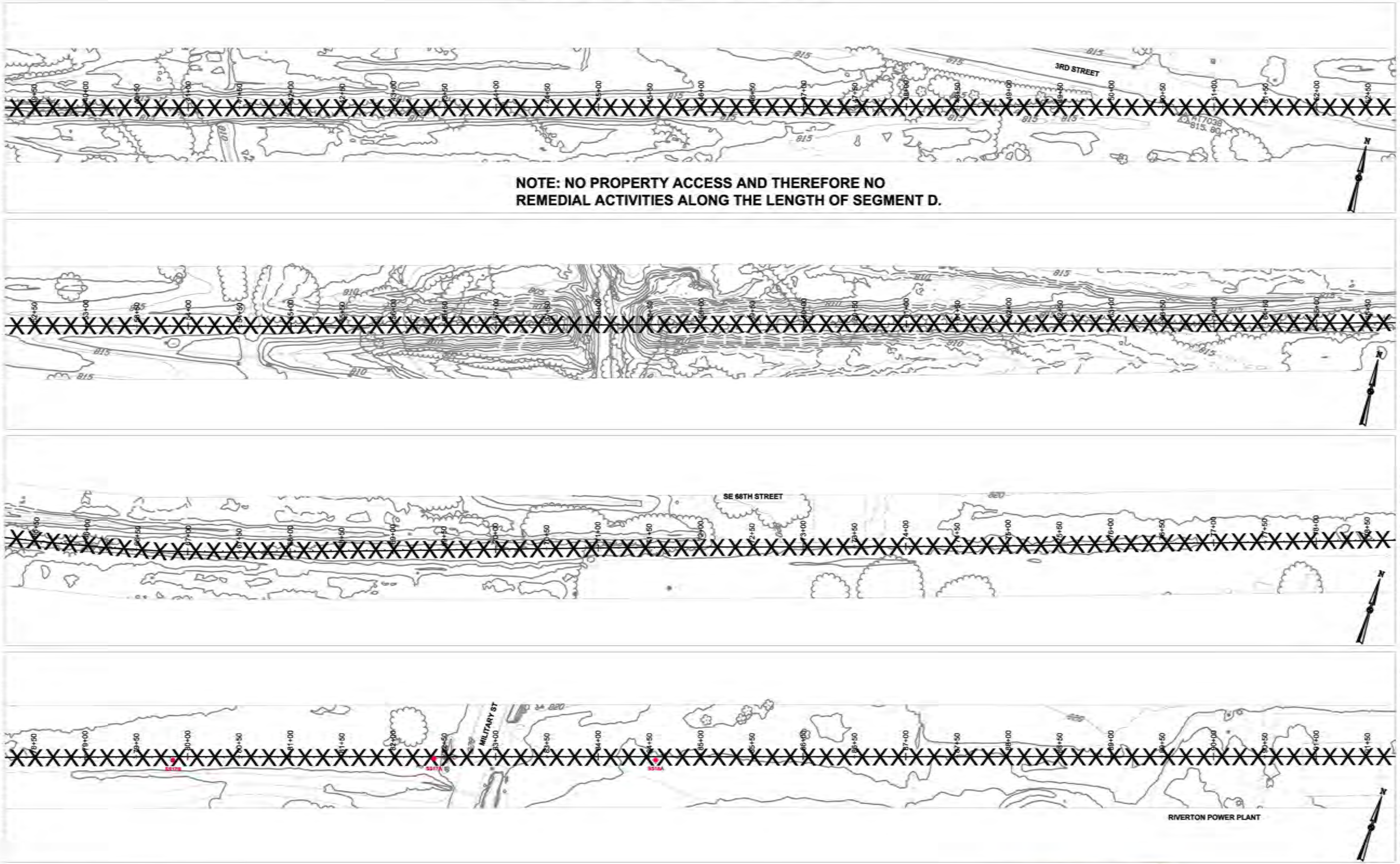
DESIGNED BY: C. FERGUSON
DATE: OCTOBER 2018
DWN BY: T. BRASWELL
CKD BY: A. FLETCHER
SOLICITATION NO.:
SUBMITTED BY: HGL
CONTRACT NO.: EP-S7-05-06 TO-0073
PLOT SCALE: 1"=50'
PLOT DATE:
FILE NUMBER: EP0073
SIZE: ANSI D
FILE NAME: C:\Users\cferguson\Documents\0073 Cherokee County ...(Aligns C-I)All_Sites.dwg

CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS
EXCAVATION AND RESTORATION PLAN
SEGMENT D, STA 0+00 to 39+50

SHEET IDENTIFICATION
C-Da

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Aligns_C-I)All_Sites.dwg
SAVE DATE: Sep 7, 2018 3:16 PM BY: Cferguson PLOT DATE: Oct 17, 2018 2:38 PM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT D - STA 39+50 to 91+50

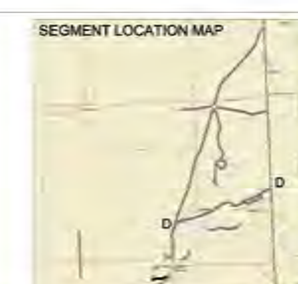


AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT __ RECEIVES STORMWATER RUNOFF FROM ________. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR ________.

2. (*DISCUSS ACCESS, IF NEEDED, OR DELETE THIS NOTE*). CONTRACTOR SHALL MEET WITH THE PROPERTY OWNER AND EPA TO ESTABLISH THE LOCATION OF THE TEMPORARY ACCESS ROAD. THE ROAD AND EXISTING CHAT TRAIL SHALL BE REMOVED TO THE LIMITS OF CONSTRUCTION AS PART OF THE SITE RESTORATION ACTIVITIES

3. REFER TO THE NOTES ON SHEETS C-02 AND C-03 FOR ADDITIONAL INFORMATION.



1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK | DESCRIPTION | DATE | APPR.

DESIGNED BY: C. FERGUSON
DWN BY: T. BRASWELL
CKD BY: A. FLETCHER
SUBMITTED BY: HGL
PLOT SCALE: 1"=50'
PLOT DATE:
SIZE: ANSI D
DATE: OCTOBER 2018
SOLICITATION NO.:
CONTRACT NO.: EP-S7-05-06 TO-0073
FILE NUMBER: EP0073
FILE NAME: (Aligns_C-I)All_Sites.dwg

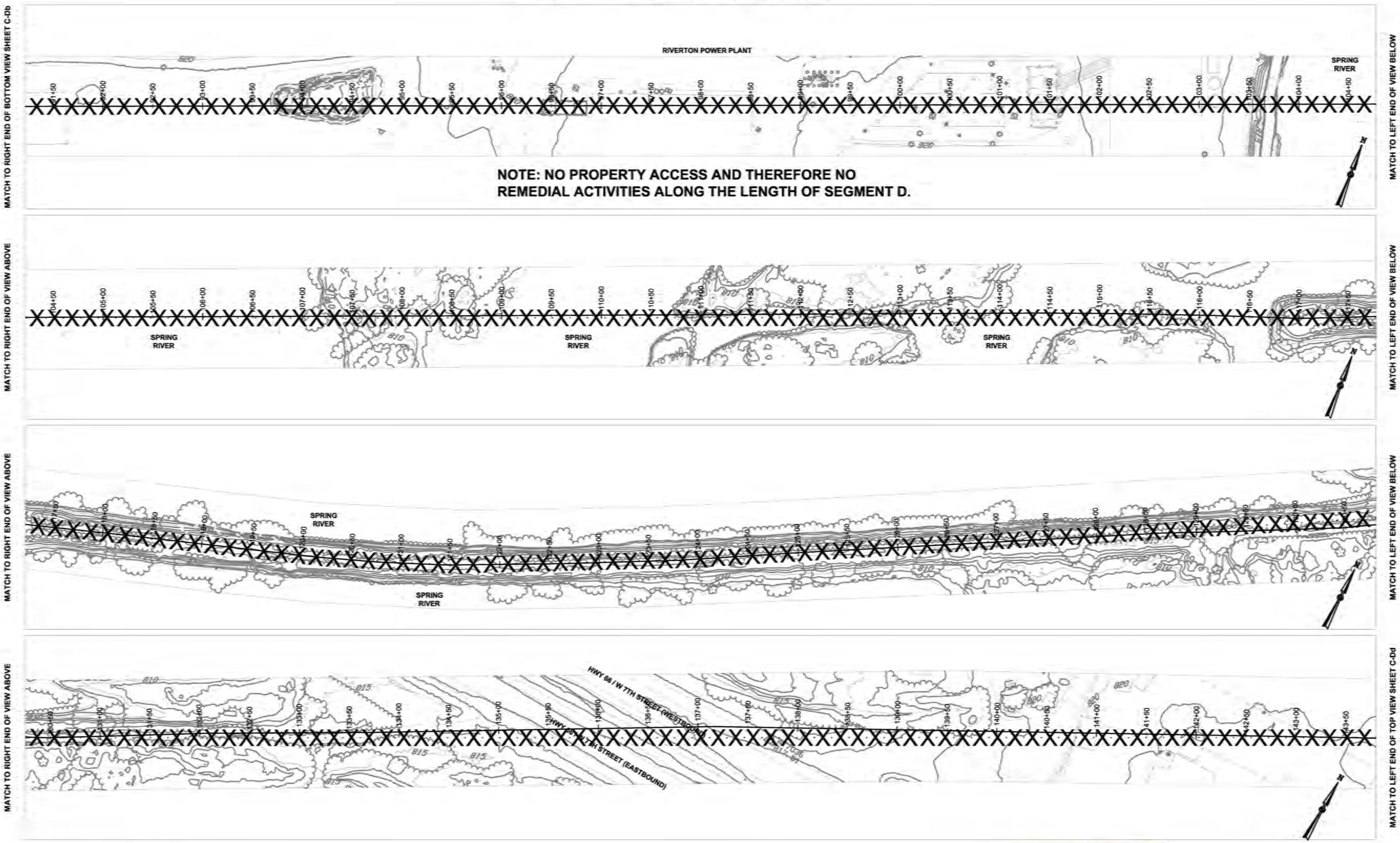
HGL

CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS
EXCAVATION AND RESTORATION PLAN
SEGMENT D, STA 39+50 to 91+50

SHEET IDENTIFICATION
C-Db

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Aligns_C-I)All_Sites.dwg
SAVE DATE: Sep 7, 2018 3:16 PM BY: Cferguson PLOT DATE: Oct 17, 2018 2:44 PM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT D - STA 91+50 to 143+50



<u>AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:</u>
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT __ RECEIVES STORMWATER RUNOFF FROM ________. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR ________.

2. (*DISCUSS ACCESS, IF NEEDED, OR DELETE THIS NOTE*). CONTRACTOR SHALL MEET WITH THE PROPERTY OWNER AND EPA TO ESTABLISH THE LOCATION OF THE TEMPORARY ACCESS ROAD. THE ROAD AND EXISTING CHAT TRAIL SHALL BE REMOVED TO THE LIMITS OF CONSTRUCTION AS PART OF THE SITE RESTORATION ACTIVITIES

3. REFER TO THE NOTES ON SHEETS C-02 AND C-03 FOR ADDITIONAL INFORMATION.

SEGMENT LOCATION MAP

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

DESIGNED BY: C. FERGUSON		DATE: OCTOBER 2018
DWN BY: T. BRASWELL	CKD BY: A. FLETCHER	SOLICITATION NO.:
SUBMITTED BY: HGL		CONTRACT NO.: EP-S7-05-05 TO-0073
PLOT SCALE: 1"=50'	PLOT DATE:	FILE NUMBER: EP0073
SIZE: ANSI D	FILE NAME: C:\Users\cferguson\Documents\0073 Cherokee County ...(Aligns_C-I)All_Sites.dwg	

HGL

CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS

EXCAVATION AND RESTORATION PLAN
SEGMENT D, STA 91+50 to 143+50

SHEET IDENTIFICATION
C-Dc

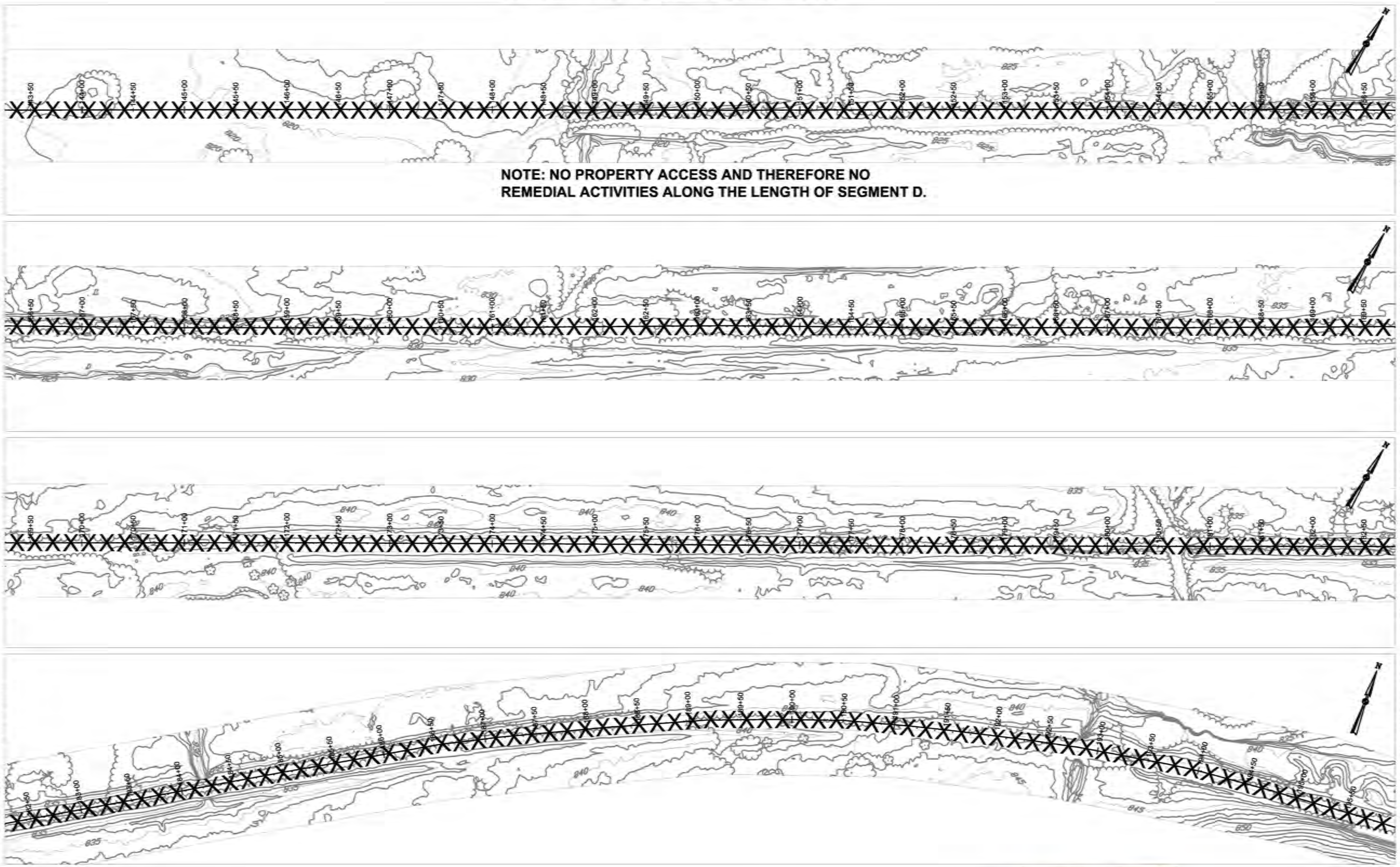
DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Aligns_C-I)All_Sites.dwg
SAVE DATE: Sep 7, 2018 3:16 PM BY: Cferguson PLOT DATE: Oct 17, 2018 3:15 PM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT D - STA 143+50 to 195+50

MATCH TO RIGHT END OF BOTTOM VIEW SHEET C-Dc

MATCH TO LEFT END OF VIEW BELOW

NOTE: NO PROPERTY ACCESS AND THEREFORE NO REMEDIAL ACTIVITIES ALONG THE LENGTH OF SEGMENT D.



MATCH TO RIGHT END OF VIEW ABOVE

MATCH TO LEFT END OF VIEW BELOW

MATCH TO RIGHT END OF VIEW ABOVE

MATCH TO LEFT END OF VIEW BELOW

MATCH TO RIGHT END OF VIEW ABOVE

MATCH TO LEFT END OF TOP VIEW SHEET C-De

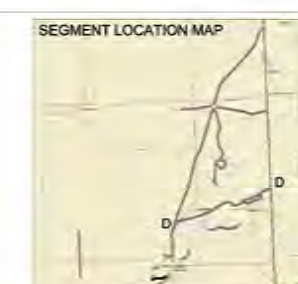
AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT ___ RECEIVES STORMWATER RUNOFF FROM ________. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR ____________.

2. (*DISCUSS ACCESS, IF NEEDED, OR DELETE THIS NOTE*). CONTRACTOR SHALL MEET WITH THE PROPERTY OWNER AND EPA TO ESTABLISH THE LOCATION OF THE TEMPORARY ACCESS ROAD. THE ROAD AND EXISTING CHAT TRAIL SHALL BE REMOVED TO THE LIMITS OF CONSTRUCTION AS PART OF THE SITE RESTORATION ACTIVITIES

3. REFER TO THE NOTES ON SHEETS C-02 AND C-03 FOR ADDITIONAL INFORMATION.

SEGMENT LOCATION MAP



1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

HGL

DESIGNED BY: C. FERGUSON
DWN BY: T. BRASWELL
CKD BY: A. FLETCHER
SUBMITTED BY: HGL
PLOT SCALE: 1"=50'
PLOT DATE:
SIZE: ANSI D
FILE NAME: C:\Users\cferguson\Documents\0073 Cherokee County ... (Aligns_C-)All_Sites.dwg
DATE: OCTOBER 2018
SOLICITATION NO.:
CONTRACT NO.: EP-S7-05-05 TO-0073
FILE NUMBER: EP0073

CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS

EXCAVATION AND RESTORATION PLAN
SEGMENT D, STA 143+50 to 195+50

SHEET IDENTIFICATION
C-Dd

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Aligns_C-)All_Sites.dwg
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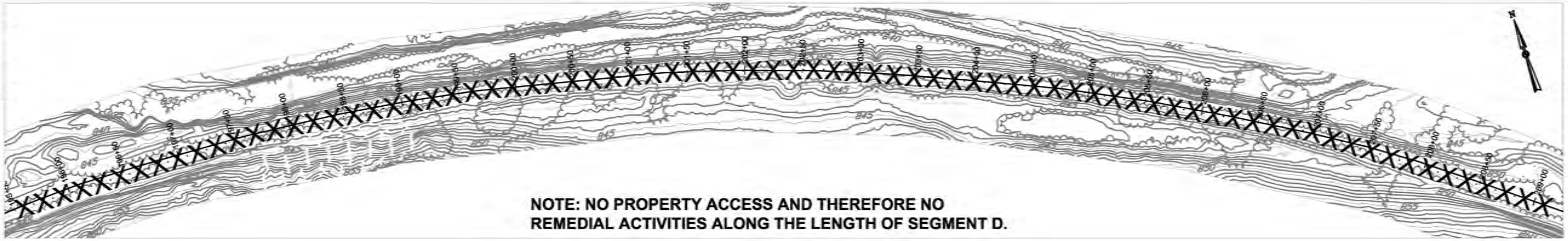
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT D - STA 196+00 to 248+50

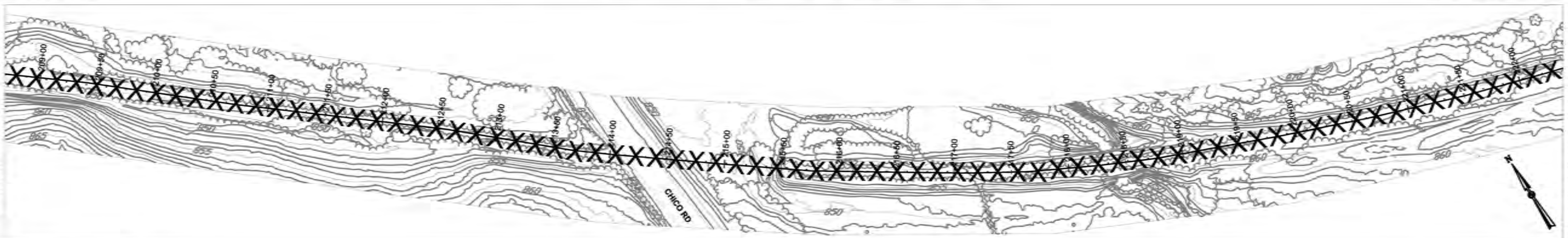
MATCH TO RIGHT END OF BOTTOM VIEW SHEET C-Dd



NOTE: NO PROPERTY ACCESS AND THEREFORE NO REMEDIAL ACTIVITIES ALONG THE LENGTH OF SEGMENT D.

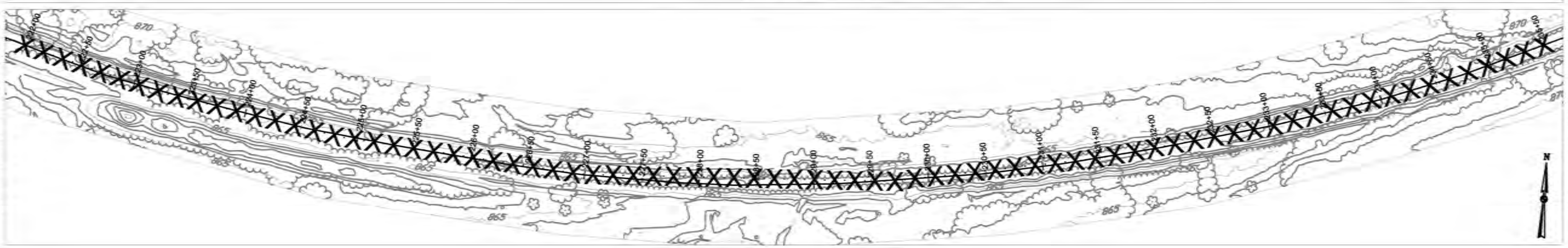
MATCH TO LEFT END OF VIEW BELOW

MATCH TO RIGHT END OF VIEW ABOVE



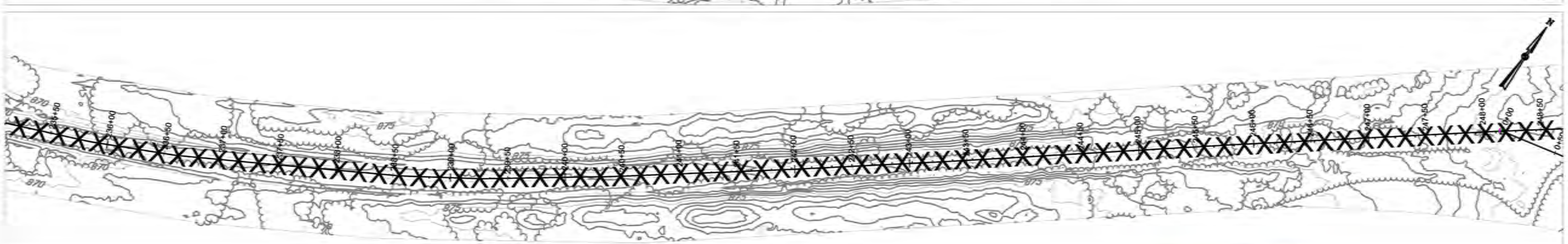
MATCH TO LEFT END OF VIEW BELOW

MATCH TO RIGHT END OF VIEW ABOVE



MATCH TO LEFT END OF VIEW BELOW

MATCH TO RIGHT END OF VIEW ABOVE



MATCH TO LEFT END OF TOP VIEW SHEET C-Df

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

HGL

DESIGNED BY: C. FERGUSON	DATE: OCTOBER 2018
DWN BY: T. BRASWELL	CKD BY: A. FLETCHER	SOLICITATION NO.:
SUBMITTED BY: HGL	CONTRACT NO.: EP-S7-05-05 TO-0073
PLOT SCALE: 1"=50'	PLOT DATE:	FILE NUMBER: EP0073
SIZE: ANSI D	FILE NAME: C:\Users\cferguson\Documents\0073 Cherokee County... (Aligns_C-I)All_Sites.dwg

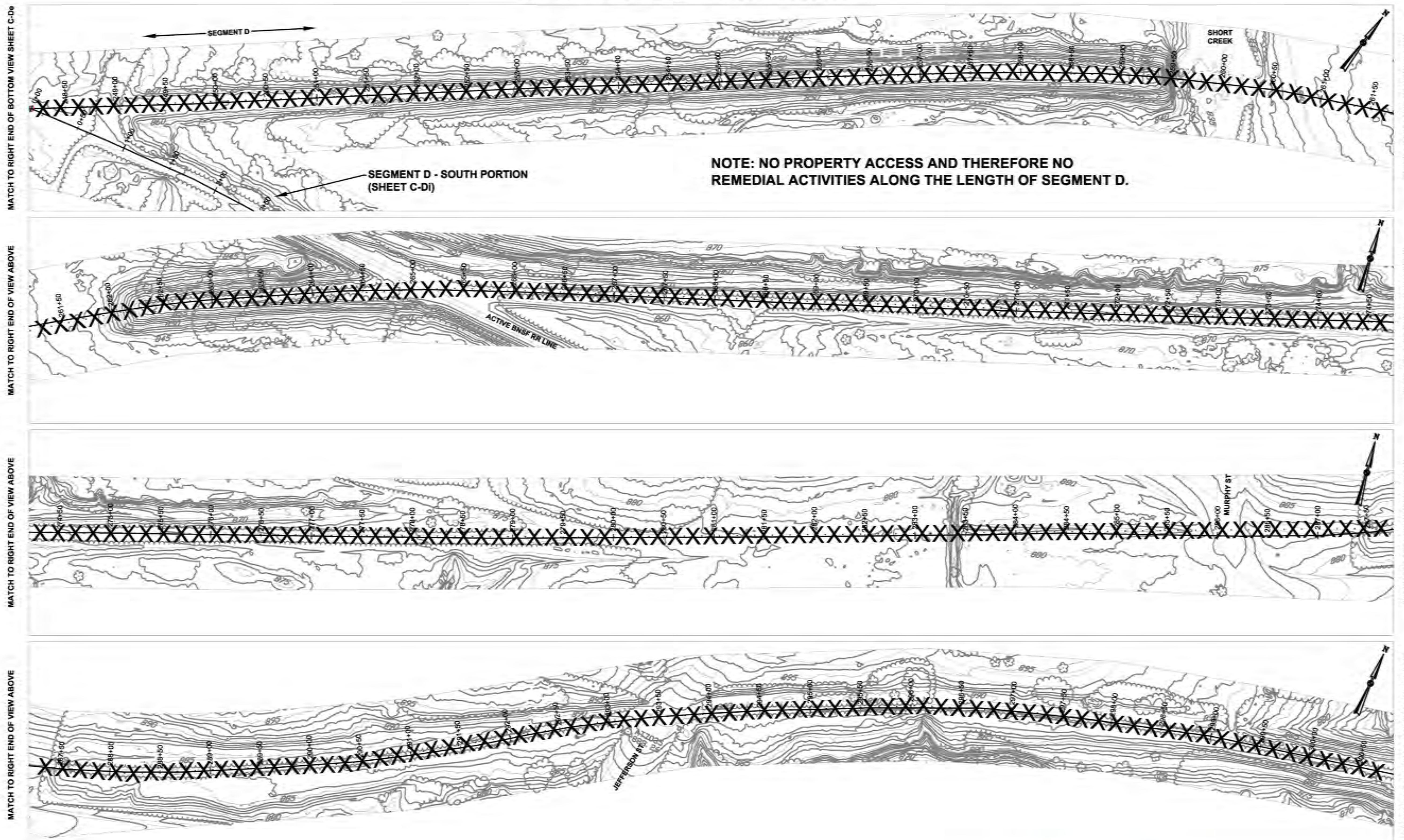
CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS

EXCAVATION AND RESTORATION PLAN
SEGMENT D, STA 196+00 to 248+50

SHEET IDENTIFICATION
C-De

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Aligns_C-I)All_Sites.dwg
SAVE DATE: Oct 26, 2018 3:04 PM BY: Cferguson PLOT DATE: Oct 26, 2018 3:18 PM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT D - STA 248+50 to 300+50



NOTE: NO PROPERTY ACCESS AND THEREFORE NO REMEDIAL ACTIVITIES ALONG THE LENGTH OF SEGMENT D.

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

HGL

DESIGNED BY: C. FERGUSON		DATE: OCTOBER 2018
DWN BY: T. BRASWELL	CKD BY: A. FLETCHER	SOLICITATION NO.:
SUBMITTED BY: HGL		CONTRACT NO.: EP-S7-05-06 TO-0073
PLOT SCALE: 1"=50'	PLOT DATE:	FILE NUMBER: EP8073
SIZE: ANSI D	FILE NAME: C:\Users\cferguson\Documents\0073 Cherokee Co... (Aligns_C-I)All_Sites.dwg	

CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS

EXCAVATION AND RESTORATION PLAN
SEGMENT D, STA 248+50 to 300+50

SHEET IDENTIFICATION
C-Df

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Aligns_C-I)All_Sites.dwg
SAVE DATE: Oct 26, 2018 3:04 PM BY: Cferguson PLOT DATE: Oct 26, 2018 3:20 PM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT D - STA 300+50 to 352+50

NOTE: NO PROPERTY ACCESS AND THEREFORE NO REMEDIAL ACTIVITIES ALONG THE LENGTH OF SEGMENT D.

MATCH TO RIGHT END OF BOTTOM VIEW SHEET C-Df

MATCH TO LEFT END OF VIEW BELOW

MATCH TO RIGHT END OF VIEW ABOVE

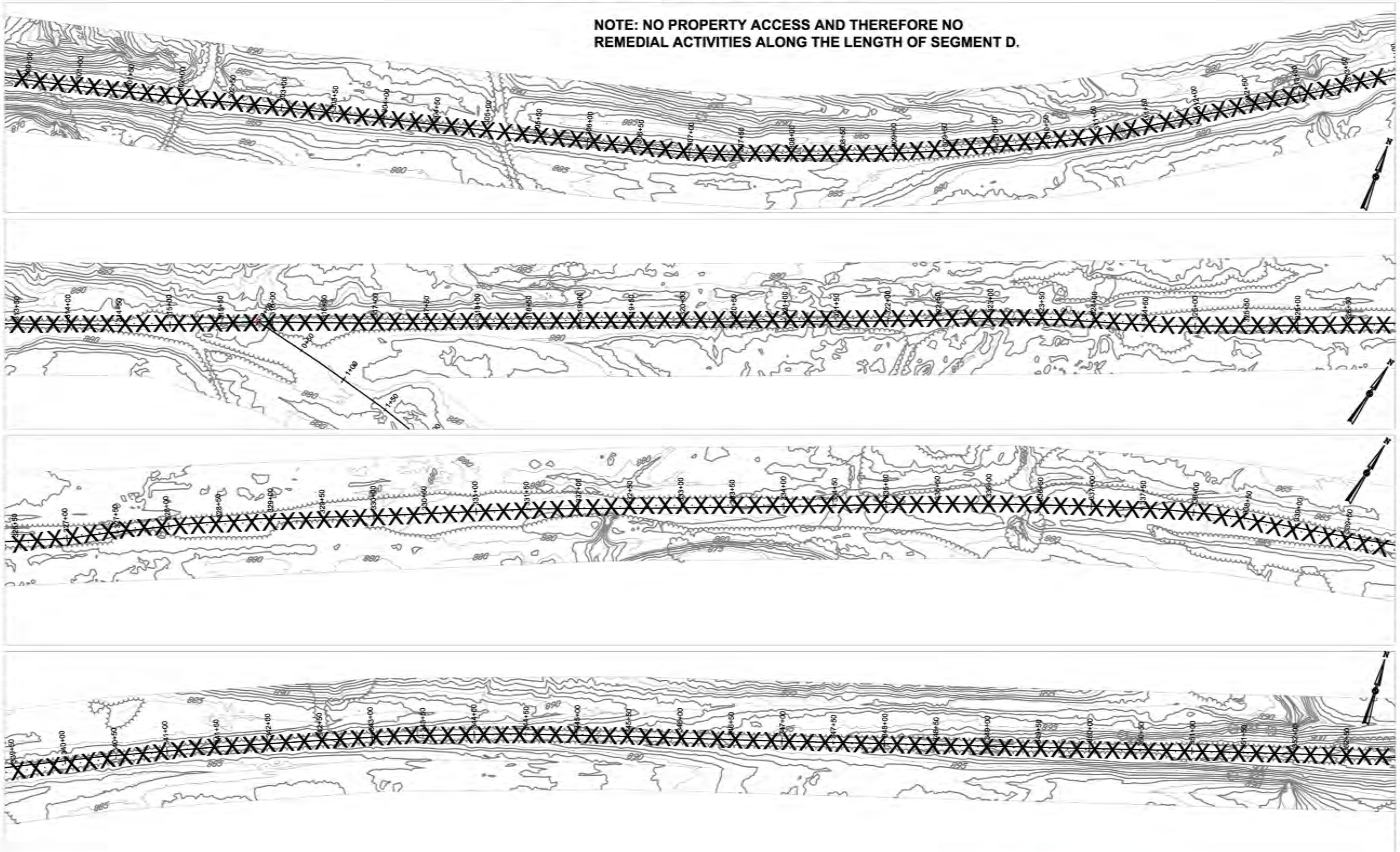
MATCH TO LEFT END OF VIEW BELOW

MATCH TO RIGHT END OF VIEW ABOVE

MATCH TO LEFT END OF VIEW BELOW

MATCH TO RIGHT END OF VIEW ABOVE

MATCH TO LEFT END OF TOP VIEW SHEET C-Dh



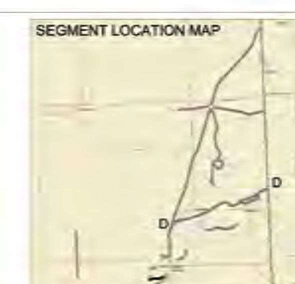
AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT ___ RECEIVES STORMWATER RUNOFF FROM _________. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR ____________.

2. (*DISCUSS ACCESS, IF NEEDED, OR DELETE THIS NOTE*). CONTRACTOR SHALL MEET WITH THE PROPERTY OWNER AND EPA TO ESTABLISH THE LOCATION OF THE TEMPORARY ACCESS ROAD. THE ROAD AND EXISTING CHAT TRAIL SHALL BE REMOVED TO THE LIMITS OF CONSTRUCTION AS PART OF THE SITE RESTORATION ACTIVITIES

3. REFER TO THE NOTES ON SHEETS C-02 AND C-03 FOR ADDITIONAL INFORMATION.

SEGMENT LOCATION MAP



1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

DESIGNED BY: C. FERGUSON
DWN BY: T. BRASWELL
CKD BY: A. FLETCHER
SUBMITTED BY: HGL
PLOT SCALE: 1"=50'
PLOT DATE:
SIZE: ANSI D
FILE NAME:
DATE: OCTOBER 2018
SOLICITATION NO.:
CONTRACT NO.: EP-S7-05-06 TO-0073
FILE NUMBER: EP0073

HGL

CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS

EXCAVATION AND RESTORATION PLAN
SEGMENT D, STA 300+50 to 352+50

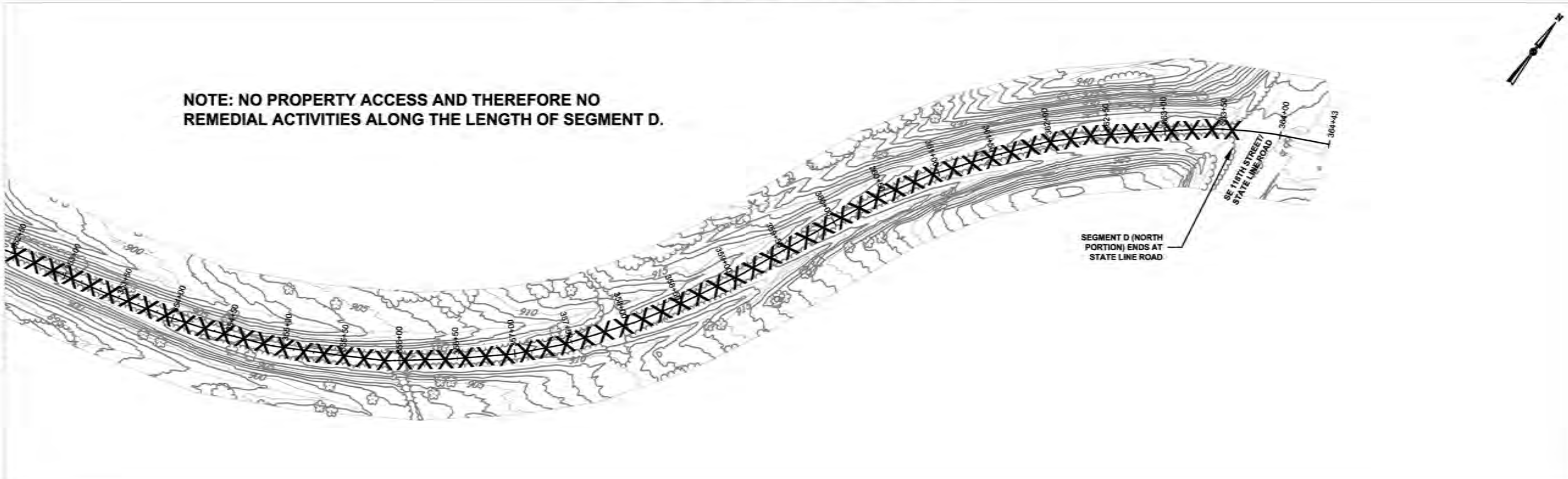
SHEET IDENTIFICATION
C-Dg

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Aligns_C-)\All_Sites.dwg
SAVE DATE: Oct 17, 2018 3:16 PM BY: Cferguson PLOT DATE: Oct 17, 2018 3:21 PM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT D - STA 352+50 to 364+43

NOTE: NO PROPERTY ACCESS AND THEREFORE NO REMEDIAL ACTIVITIES ALONG THE LENGTH OF SEGMENT D.

MATCH TO RIGHT END OF BOTTOM VIEW SHEET C-Dg



SEGMENT A SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

[these notes will be updated for the final version of drawings]

SEGMENT LOCATION MAP

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

DESIGNED BY: C. FERGUSON
DWN BY: T. BRASWELL
CKD BY: A. FLETCHER
SUBMITTED BY: HGL
PLOT SCALE: 1"=50'
PLOT DATE:
SIZE: ANSI D
FILE NAME: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Aligns_C-I)All_Sites.dwg
DATE: OCTOBER 2018
SOLICITATION NO.:
CONTRACT NO.: EP-S7-05-05 TO-0073
FILE NUMBER: EP0073

HGL

CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS
EXCAVATION AND RESTORATION PLAN
SEGMENT D, STA 352+50 to 364+43

SHEET IDENTIFICATION
C-Dh

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Aligns_C-I)All_Sites.dwg
SAVE DATE: Oct 26, 2018 3:35 PM BY: Cferguson PLOT DATE: Oct 26, 2018 3:35 PM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT D (SOUTH SPAN) - STA 0+00 to 52+50

NOTE: NO PROPERTY ACCESS AND THEREFORE NO REMEDIAL ACTIVITIES ALONG THE LENGTH OF SEGMENT D.

AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT ___ RECEIVES STORMWATER RUNOFF FROM ________. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR ___________.

2. (*DISCUSS ACCESS, IF NEEDED, OR DELETE THIS NOTE*). CONTRACTOR SHALL MEET WITH THE PROPERTY OWNER AND EPA TO ESTABLISH THE LOCATION OF THE TEMPORARY ACCESS ROAD. THE ROAD AND EXISTING CHAT TRAIL SHALL BE REMOVED TO THE LIMITS OF CONSTRUCTION AS PART OF THE SITE RESTORATION ACTIVITIES

3. REFER TO THE NOTES ON SHEETS C-02 AND C-03 FOR ADDITIONAL INFORMATION.

SEGMENT LOCATION MAP

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

HGL

DESIGNED BY: C. FERGUSON		DATE: OCTOBER 2018
DWN BY: T. BRASWELL	CKD BY: A. FLETCHER	SOLICITATION NO.:
SUBMITTED BY: HGL		CONTRACT NO.: EP-S7-05-06 TO-0073
PLOT SCALE: 1"=50'	PLOT DATE:	FILE NUMBER: EP8073
SIZE: ANSI D	FILE NAME: C:\Users\cferguson\Documents\0073 Cherokee County ... (Aligns_C-)\All_Sites.dwg	

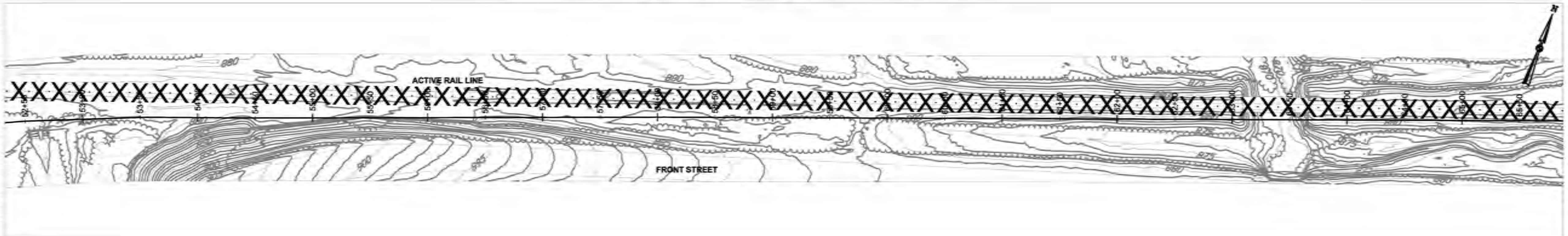
CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS
EXCAVATION AND RESTORATION PLAN
SEGMENT D, STA 0+00 to 52+50

SHEET IDENTIFICATION
C-Di

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Aligns_C-)\All_Sites.dwg
SAVE DATE: Oct 17, 2018 3:22 PM BY: Cferguson PLOT DATE: Oct 17, 2018 4:06 PM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

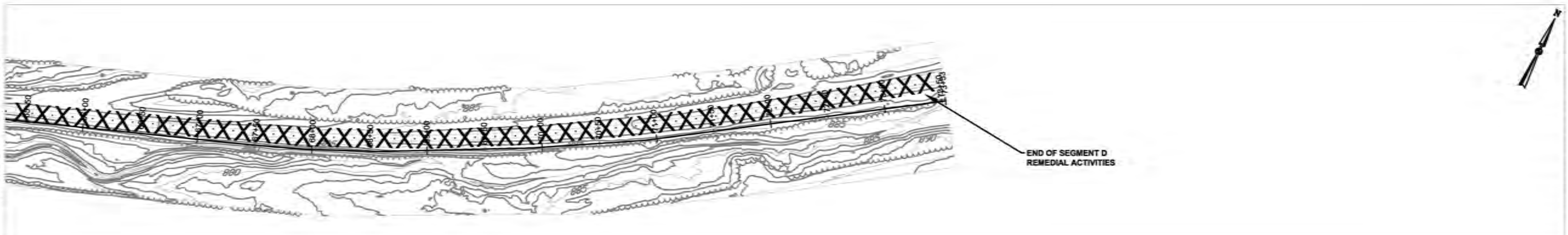
SEGMENT D (SOUTH SPAN) - STA 52+50 to 73+53

MATCH TO RIGHT END OF BOTTOM VIEW SHEET C-Di



MATCH TO LEFT END OF VIEW BELOW

MATCH TO RIGHT END OF VIEW ABOVE



MATCH TO LEFT END OF VIEW BELOW

NOTE: NO PROPERTY ACCESS AND THEREFORE NO REMEDIAL ACTIVITIES ALONG THE LENGTH OF SEGMENT D.

MATCH TO RIGHT END OF VIEW ABOVE

SEGMENT A SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

[these notes will be updated for the final version of drawings]

SEGMENT LOCATION MAP

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

HGL

DESIGNED BY: C. FERGUSON
DATE: OCTOBER 2018
DWN BY: T. BRASWELL
CKD BY: A. FLETCHER
SOLICITATION NO.:
SUBMITTED BY: HGL
CONTRACT NO.: EP-S7-05-05 TO-0073
PLOT SCALE: 1"=50'
PLOT DATE:
FILE NUMBER: EP0073
SIZE: ANSI D
FILE NAME: C:\Users\CFERGU~1\AppData\Local\Temp\(Aligns_C-I)All_Sites.dwg

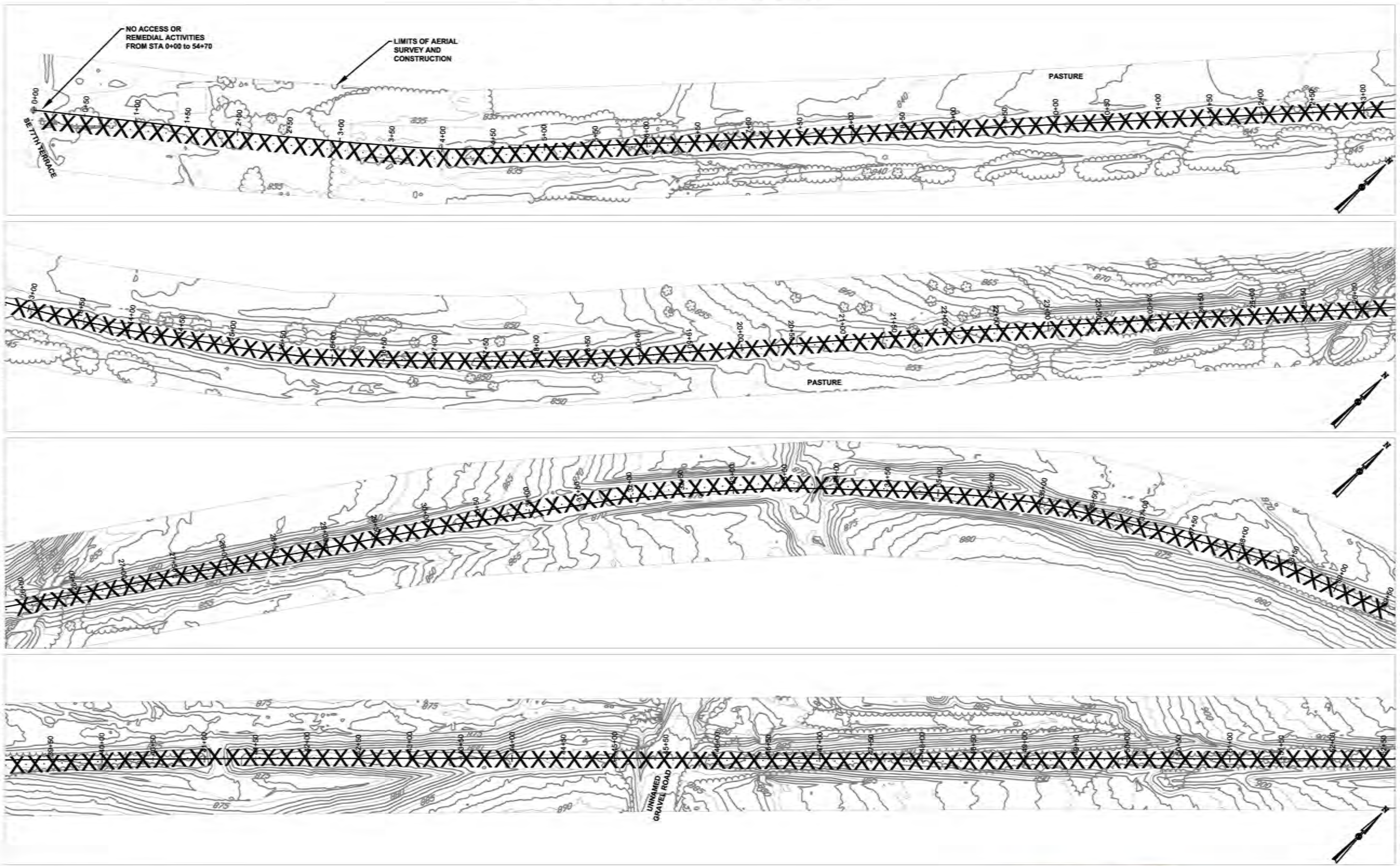
CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS

EXCAVATION AND RESTORATION PLAN
SEGMENT D, STA 52+50 to 73+53

SHEET IDENTIFICATION
C-Dj

DWG FILE: C:\Users\CFERGU~1\AppData\Local\Temp\(Aligns_C-I)All_Sites.dwg
SAVE DATE: Oct 26, 2018 2:31 PM BY: Cferguson PLOT DATE: Oct 26, 2018 2:34 PM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT E - STA 0+00 to 52+50



AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT ___ RECEIVES STORMWATER RUNOFF FROM _________. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR ____________.

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3. REFER TO THE NOTES ON SHEETS C-02 AND C-03 FOR ADDITIONAL INFORMATION.

SEGMENT LOCATION MAP

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

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DESIGNED BY: C. FERGUSON	DATE: OCTOBER 2018
DWN BY: T. BRASWELL	CKD BY: A. FLETCHER	SOLICITATION NO.:
SUBMITTED BY: HGL	CONTRACT NO.: EP-S7-05-05 TO-0073
PLOT SCALE: 1"=50'	PLOT DATE:	FILE NUMBER: EP0073
SIZE: ANSI D	FILE NAME: (Aligns_C-I)All_Sites.dwg

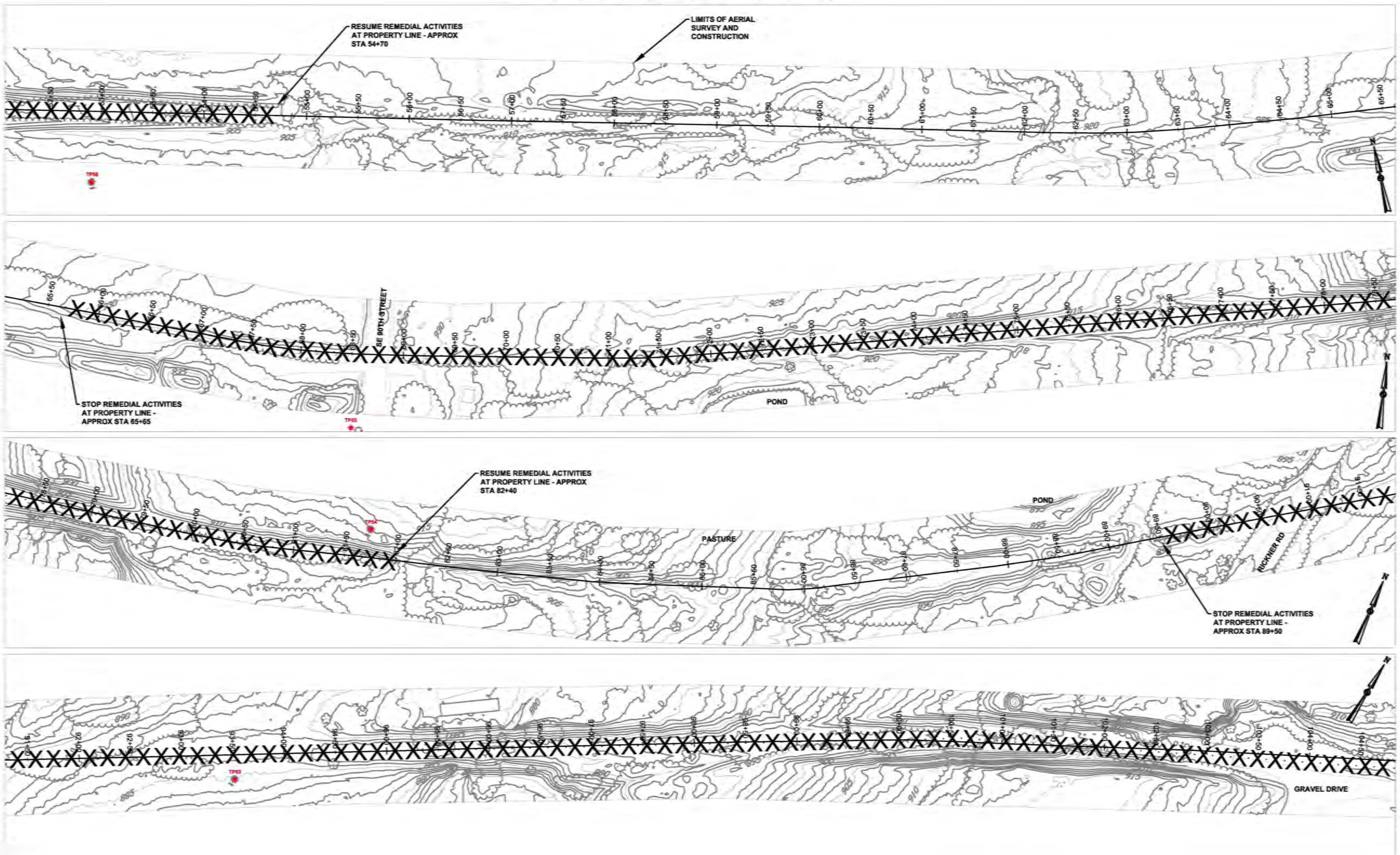
HGL

CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS
EXCAVATION AND RESTORATION PLAN
SEGMENT E, STA 0+00 to 52+50

SHEET IDENTIFICATION
C-Ea

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Aligns_C-I)All_Sites.dwg
SAVE DATE: Oct 17, 2018 3:22 PM BY: Cferguson PLOT DATE: Oct 17, 2018 4:11 PM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT E - STA 52+50 to 104+50



SEGMENT A SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

[these notes will be updated for the final version of drawings]

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

DESIGNED BY: C. FERGUSON | DATE: OCTOBER 2018
DWN BY: T. BRASWELL | CKD BY: A. FLETCHER | SOLICITATION NO.:
SUBMITTED BY: HGL | CONTRACT NO.: EP-S7-05-05 TO-0073
PLOT SCALE: 1"=50' | PLOT DATE: | FILE NUMBER: EP0073
SIZE: ANSI D | FILE NAME: C:\Users\cferguson\Documents\0073 Cherokee County ... (Aligns_C-I)All_Sites.dwg

HGL

CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS

EXCAVATION AND RESTORATION PLAN
SEGMENT E, STA 52+50 to 104+50

SHEET IDENTIFICATION
C-Eb

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Aligns_C-I)All_Sites.dwg
SAVE DATE: Oct 26, 2018 3:35 PM BY: Cferguson PLOT DATE: Oct 26, 2018 3:40 PM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT E - STA 104+50 to 107+34

MATCH TO RIGHT END OF BOTTOM VIEW SHEET C-Eb

AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT ___ RECEIVES STORMWATER RUNOFF FROM ________. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR ___________.

2. (*DISCUSS ACCESS, IF NEEDED, OR DELETE THIS NOTE*). CONTRACTOR SHALL MEET WITH THE PROPERTY OWNER AND EPA TO ESTABLISH THE LOCATION OF THE TEMPORARY ACCESS ROAD. THE ROAD AND EXISTING CHAT TRAIL SHALL BE REMOVED TO THE LIMITS OF CONSTRUCTION AS PART OF THE SITE RESTORATION ACTIVITIES

3. REFER TO THE NOTES ON SHEETS C-02 AND C-03 FOR ADDITIONAL INFORMATION.

SEGMENT LOCATION MAP

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

DESIGNED BY: C. FERGUSON		DATE: OCTOBER 2018
DWN BY: T. BRASWELL	CKD BY: A. FLETCHER	SOLICITATION NO.:
SUBMITTED BY: HGL		CONTRACT NO.: EP-S7-05-05 TO-0073
PLOT SCALE: 1"=50'	PLOT DATE:	FILE NUMBER: EP8073
SIZE: ANSI D	FILE NAME: C:\Users\cferguson\Documents\0073 Cherokee County ...\Aligns_C-I)All_Sites.dwg	

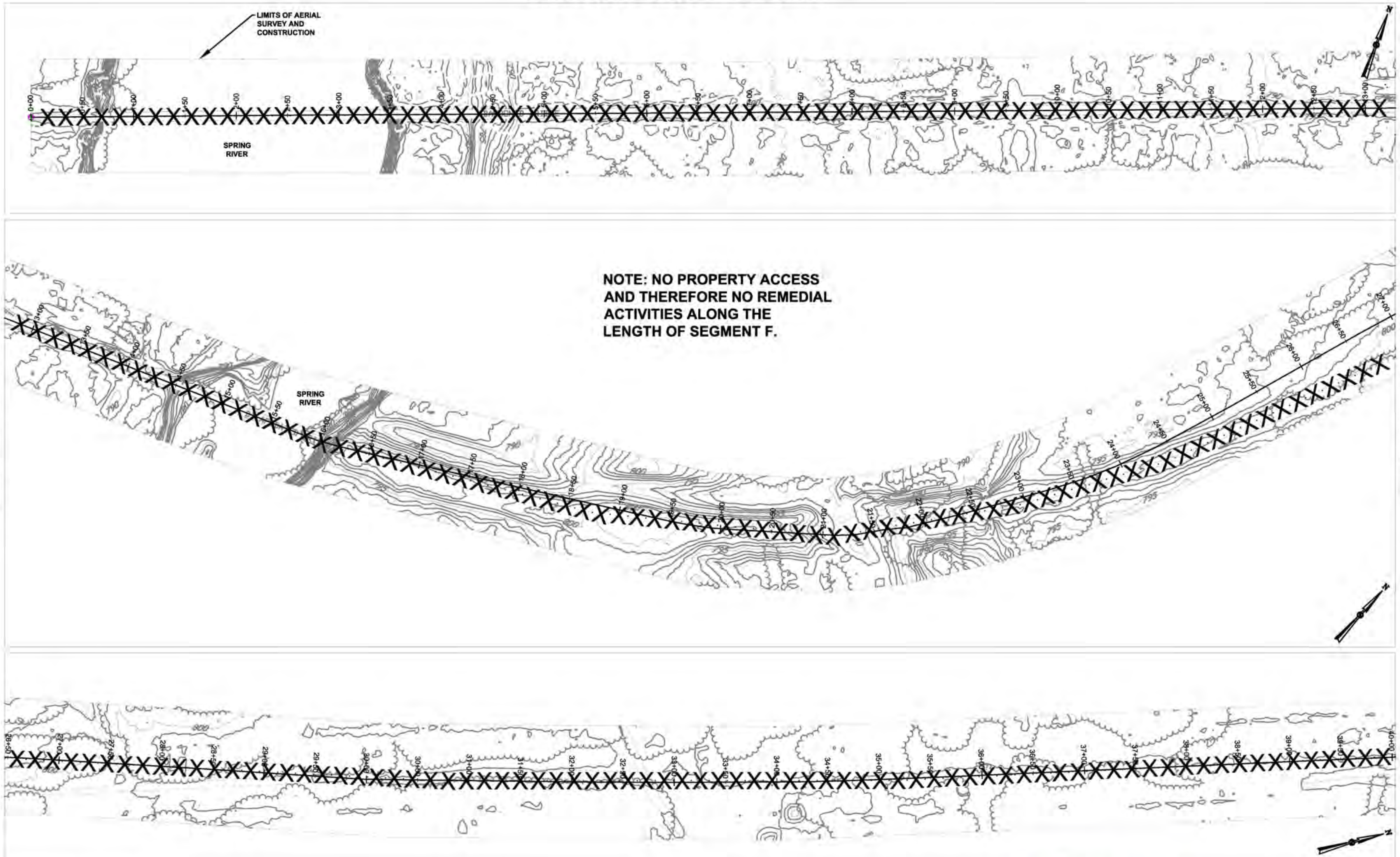
HGL

CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS
EXCAVATION AND RESTORATION PLAN
SEGMENT E, STA 104+50 to 107+34

SHEET IDENTIFICATION
C-Ec

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Aligns_C-I)All_Sites.dwg
SAVE DATE: Oct 17, 2018 3:22 PM BY: Cferguson PLOT DATE: Oct 17, 2018 4:16 PM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT F - STA 0+00 to 40+00

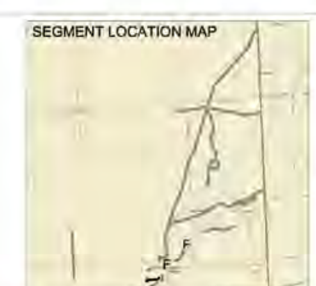


AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT ___ RECEIVES STORMWATER RUNOFF FROM ________. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR ___________.

2. (*DISCUSS ACCESS, IF NEEDED, OR DELETE THIS NOTE*). CONTRACTOR SHALL MEET WITH THE PROPERTY OWNER AND EPA TO ESTABLISH THE LOCATION OF THE TEMPORARY ACCESS ROAD. THE ROAD AND EXISTING CHAT TRAIL SHALL BE REMOVED TO THE LIMITS OF CONSTRUCTION AS PART OF THE SITE RESTORATION ACTIVITIES

3. REFER TO THE NOTES ON SHEETS C-02 AND C-03 FOR ADDITIONAL INFORMATION.



1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

DESIGNED BY: C. FERGUSON		DATE: OCTOBER 2018
DWN BY: T. BRASWELL	CKD BY: A. FLETCHER	SOLICITATION NO.:
SUBMITTED BY: HGL		CONTRACT NO.: EP-S7-05-05 TO-0073
PLOT SCALE: 1"=50'	PLOT DATE:	FILE NUMBER: EP8073
SIZE: ANSI D	FILE NAME:	

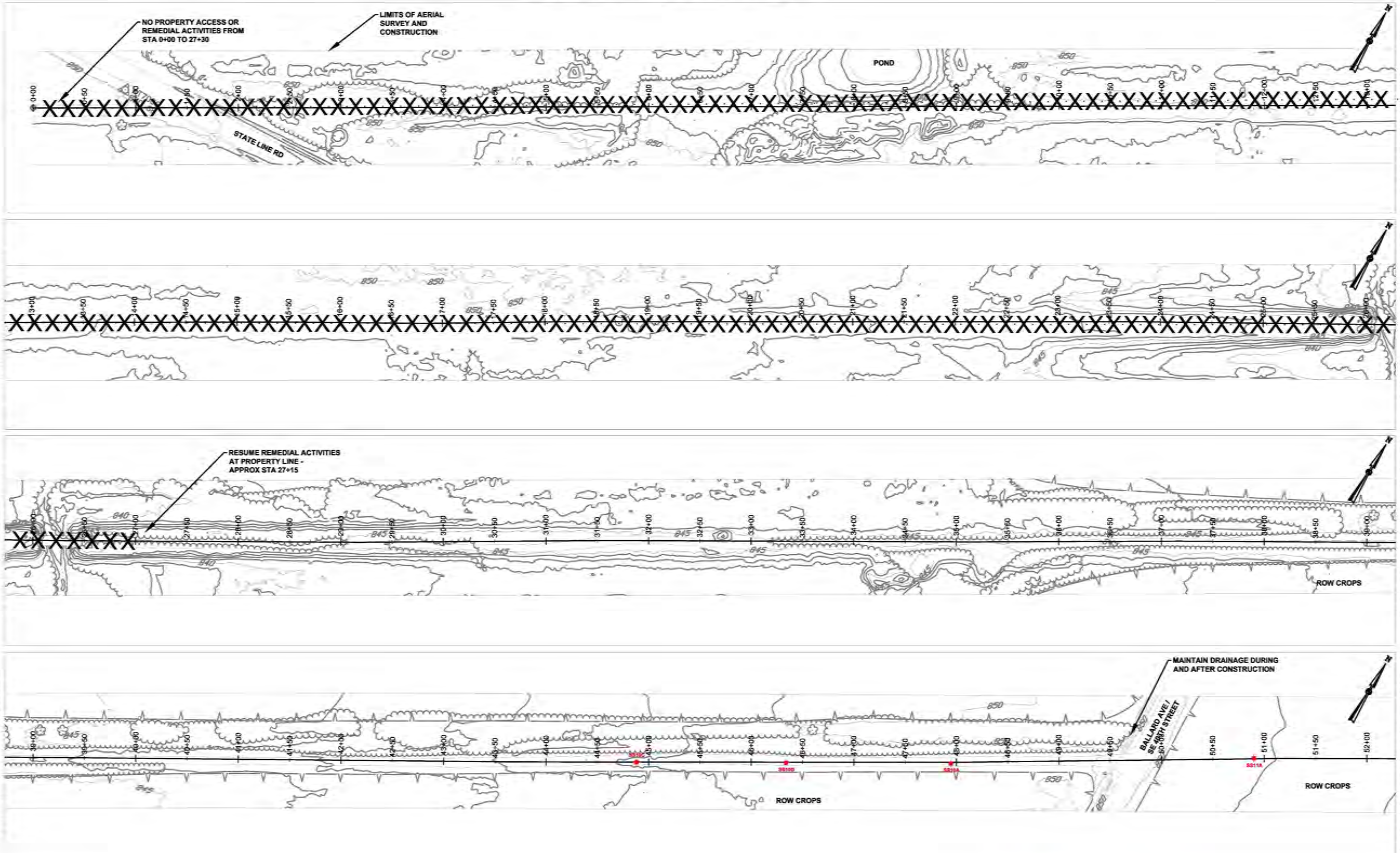
HGL

CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS
EXCAVATION AND RESTORATION PLAN
SEGMENT F, STA 0+00 to 40+00

SHEET IDENTIFICATION
C-Fa

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\Aligns_C-I\All_Sites.dwg
SAVE DATE: Oct 17, 2018 3:22 PM BY: Cferguson PLOT DATE: Oct 17, 2018 4:17 PM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT H1 - STA 0+00 to 52+00



AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT __ RECEIVES STORMWATER RUNOFF FROM ________. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR ____________.

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3. REFER TO THE NOTES ON SHEETS C-02 AND C-03 FOR ADDITIONAL INFORMATION.

SEGMENT LOCATION MAP

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

DESIGNED BY: C. FERGUSON
DWN BY: T. BRASWELL
CKD BY: A. FLETCHER
SUBMITTED BY: HGL
PLOT SCALE: 1"=50'
PLOT DATE:
SIZE: ANSI D
FILE NAME:
DATE: OCTOBER 2018
SOLICITATION NO.:
CONTRACT NO.: EP-S7-05-05 TO-0073
FILE NUMBER: EP8073

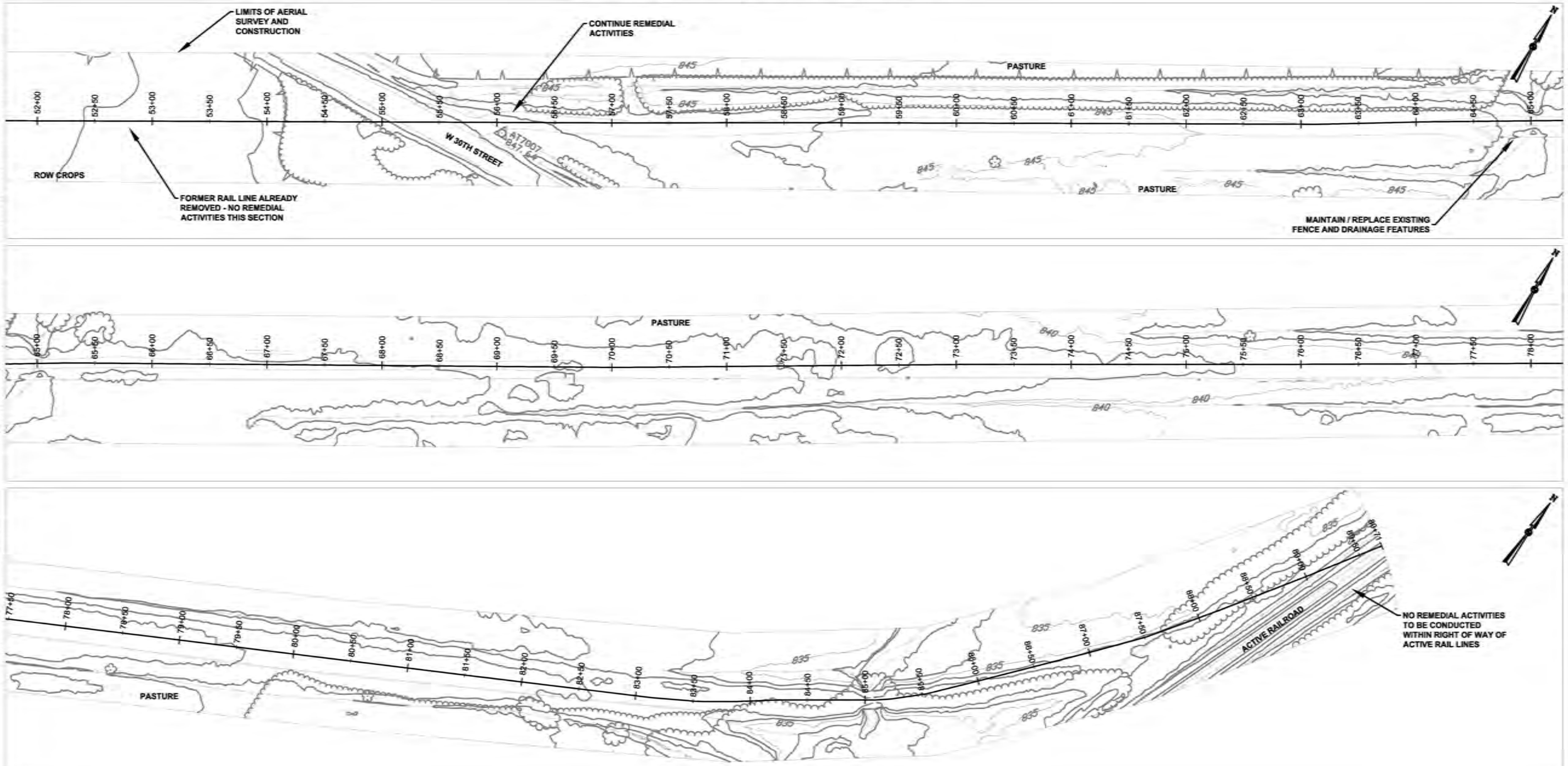
HGL

CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS
EXCAVATION AND RESTORATION PLAN
SEGMENT H1, STA 0+00 to 52+00

SHEET IDENTIFICATION
C-H1a

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Aligns_C-I)All_Sites.dwg
SAVE DATE: Oct 17, 2018 3:22 PM BY: Cferguson PLOT DATE: Oct 17, 2018 4:20 PM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT H1 - STA 52+00 to 89+71



SEGMENT A SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

[these notes will be updated for the final version of drawings]

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

DESIGNED BY: C. FERGUSON		DATE: OCTOBER 2018
DWN BY: T. BRASWELL	CKD BY: A. FLETCHER	SOLICITATION NO.:
SUBMITTED BY: HGL		CONTRACT NO.: EP-S7-05-05 TO-0073
PLOT SCALE: 1"=50'	PLOT DATE:	FILE NUMBER: EP0073
SIZE: ANSI D	FILE NAME:	

HGL

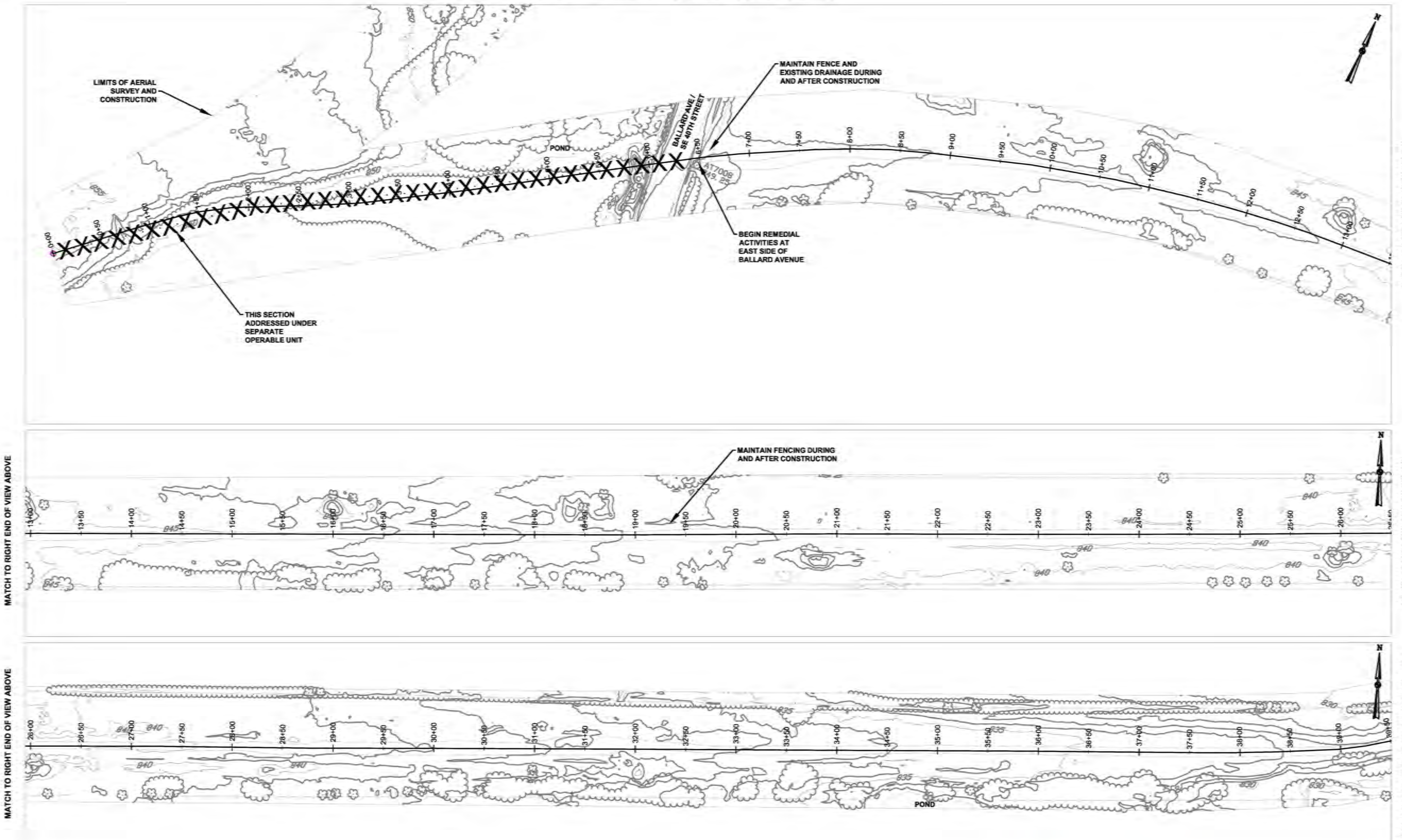
CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS

EXCAVATION AND RESTORATION PLAN
SEGMENT H1, STA 52+00 to 89+71

SHEET IDENTIFICATION
C-H1b

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Aligns_C-I)All_Sites.dwg
SAVE DATE: Oct 26, 2018 3:46 PM BY: Cferguson PLOT DATE: Oct 26, 2018 3:47 PM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT H2 - STA 0+00 to 39+00



AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT ___ RECEIVES STORMWATER RUNOFF FROM _________. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR ____________.

2. (*DISCUSS ACCESS, IF NEEDED, OR DELETE THIS NOTE*). CONTRACTOR SHALL MEET WITH THE PROPERTY OWNER AND EPA TO ESTABLISH THE LOCATION OF THE TEMPORARY ACCESS ROAD. THE ROAD AND EXISTING CHAT TRAIL SHALL BE REMOVED TO THE LIMITS OF CONSTRUCTION AS PART OF THE SITE RESTORATION ACTIVITIES

3. REFER TO THE NOTES ON SHEETS C-02 AND C-03 FOR ADDITIONAL INFORMATION.

SEGMENT LOCATION MAP

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

DESIGNED BY: C. FERGUSON
DATE: OCTOBER 2018
DWN BY: T. BRASWELL
CKD BY: A. FLETCHER
SOLICITATION NO.:
SUBMITTED BY: HGL
CONTRACT NO.: EP-S7-05-05 TO-0073
PLOT SCALE: 1"=50'
PLOT DATE:
FILE NUMBER: EP0073
SIZE: ANSI D
FILE NAME: C:\Users\cferguson\Documents\0073 Cherokee County ... (Aligns_C-I)All_Sites.dwg

HGL

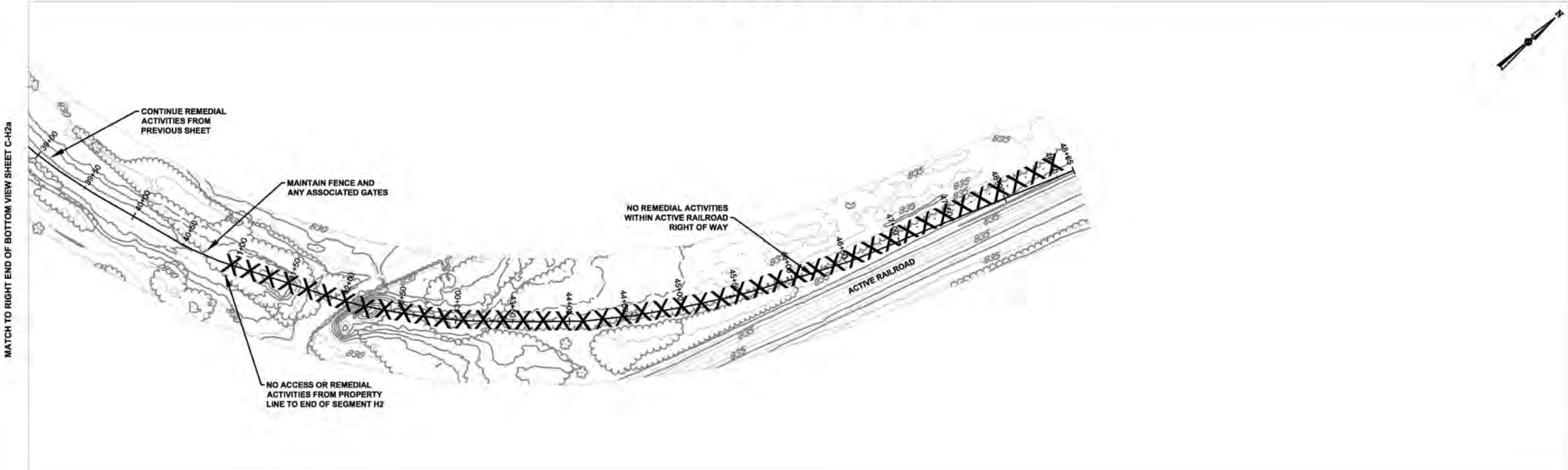
CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS

EXCAVATION AND RESTORATION PLAN
SEGMENT H2, STA 0+00 to 39+00

SHEET IDENTIFICATION
C-H2a

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Aligns_C-I)All_Sites.dwg
SAVE DATE: Oct 17, 2018 3:22 PM BY: Cferguson PLOT DATE: Oct 17, 2018 4:22 PM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT H2 - STA 39+00 to 48+65



<u>AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:</u>
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT ___ RECEIVES STORMWATER RUNOFF FROM ________. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR ___________.

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SEGMENT LOCATION MAP

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

DESIGNED BY: C. FERGUSON | DATE: OCTOBER 2018
DWN BY: T. BRASWELL | CKD BY: A. FLETCHER | SOLICITATION NO.:
SUBMITTED BY: HGL | CONTRACT NO.: EP-S7-05-05 TO-0073
PLOT SCALE: 1"=50' | PLOT DATE: | FILE NUMBER: EP8073
SIZE: ANSI D | FILE NAME: C:\Users\cferguson\Documents\0073 Cherokee County ...\Aligns_C-)All_Sites.dwg

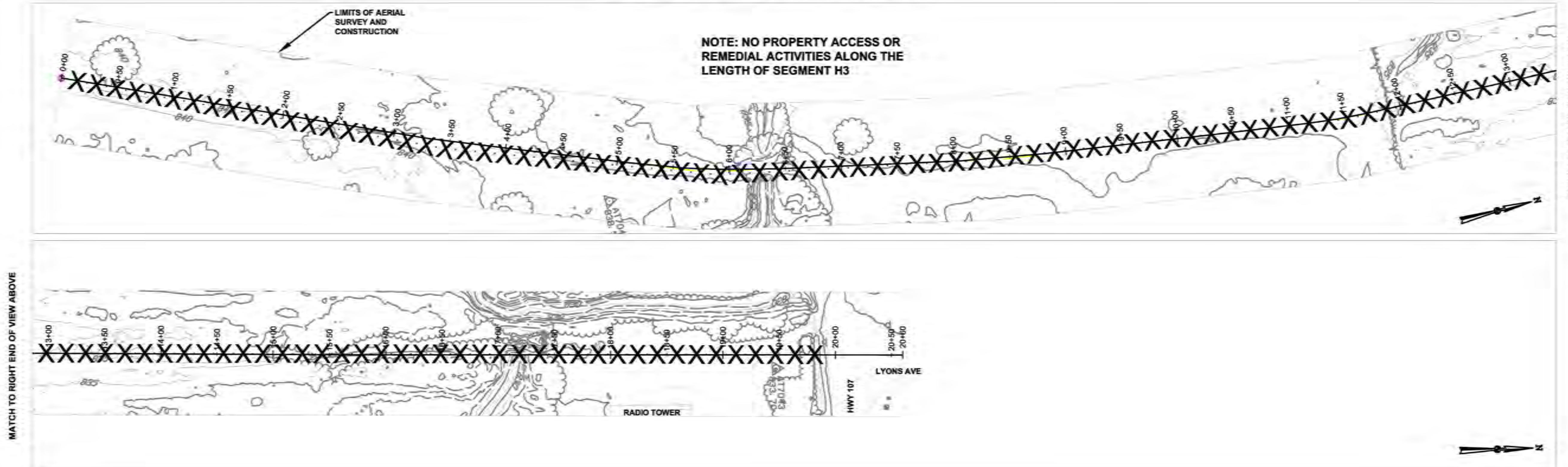
HGL

CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS
EXCAVATION AND RESTORATION PLAN
SEGMENT H2, STA 39+00 to 48+65

SHEET IDENTIFICATION
C-H2b

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Aligns_C-)All_Sites.dwg
SAVE DATE: Oct 26, 2018 3:46 PM BY: Cferguson PLOT DATE: Oct 26, 2018 3:50 PM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT H3 - STA 0+00 to 20+60



AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT __ RECEIVES STORMWATER RUNOFF FROM ________. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR ___________.

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3. REFER TO THE NOTES ON SHEETS C-02 AND C-03 FOR ADDITIONAL INFORMATION.

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

DESIGNED BY: C. FERGUSON		DATE: OCTOBER 2018
DWN BY: T. BRASWELL	CKD BY: A. FLETCHER	SOLICITATION NO.:
SUBMITTED BY: HGL		CONTRACT NO.: EP-S7-05-05 TO-0073
PLOT SCALE: 1"=50'	PLOT DATE:	FILE NUMBER: EP0073
SIZE: ANSI D	FILE NAME:	

HGL

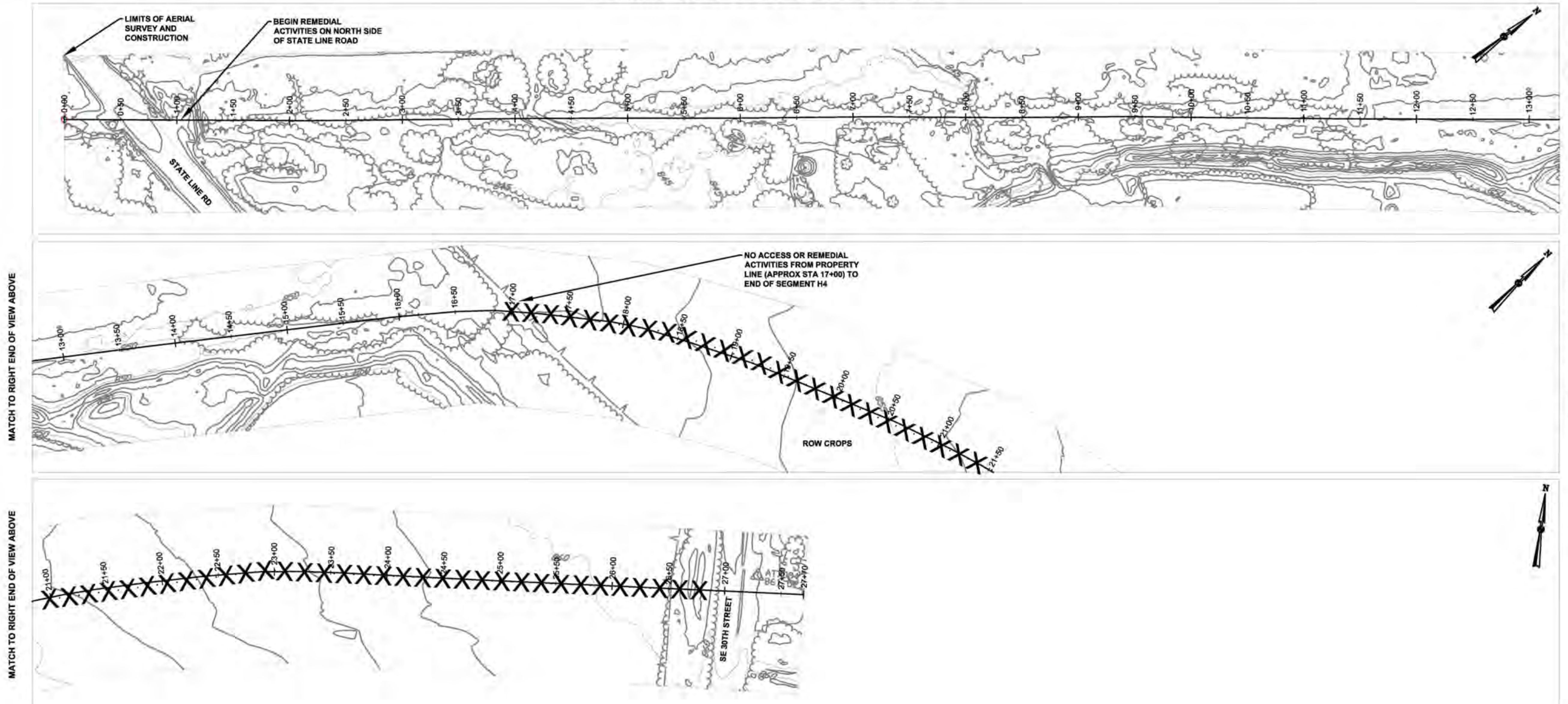
CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS

EXCAVATION AND RESTORATION PLAN
SEGMENT H3, STA 0+00 to 20+60

SHEET IDENTIFICATION
C-H3a

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Aligns_C-I)All_Sites.dwg
SAVE DATE: Oct 17, 2018 3:22 PM BY: Cferguson PLOT DATE: Oct 17, 2018 4:25 PM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT H4 - STA 0+00 to 27+70



AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT ___ RECEIVES STORMWATER RUNOFF FROM ________. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR ___________.

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3. REFER TO THE NOTES ON SHEETS C-02 AND C-03 FOR ADDITIONAL INFORMATION.

SEGMENT LOCATION MAP

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

HGL

DESIGNED BY: C. FERGUSON		DATE: OCTOBER 2018
DWN BY: T. BRASWELL	CKD BY: A. FLETCHER	SOLICITATION NO.:
SUBMITTED BY: HGL		CONTRACT NO.: EP-S7-05-05 TO-0073
PLOT SCALE: 1"=50'	PLOT DATE:	FILE NUMBER: EP0073
SIZE: ANSI D	FILE NAME:	

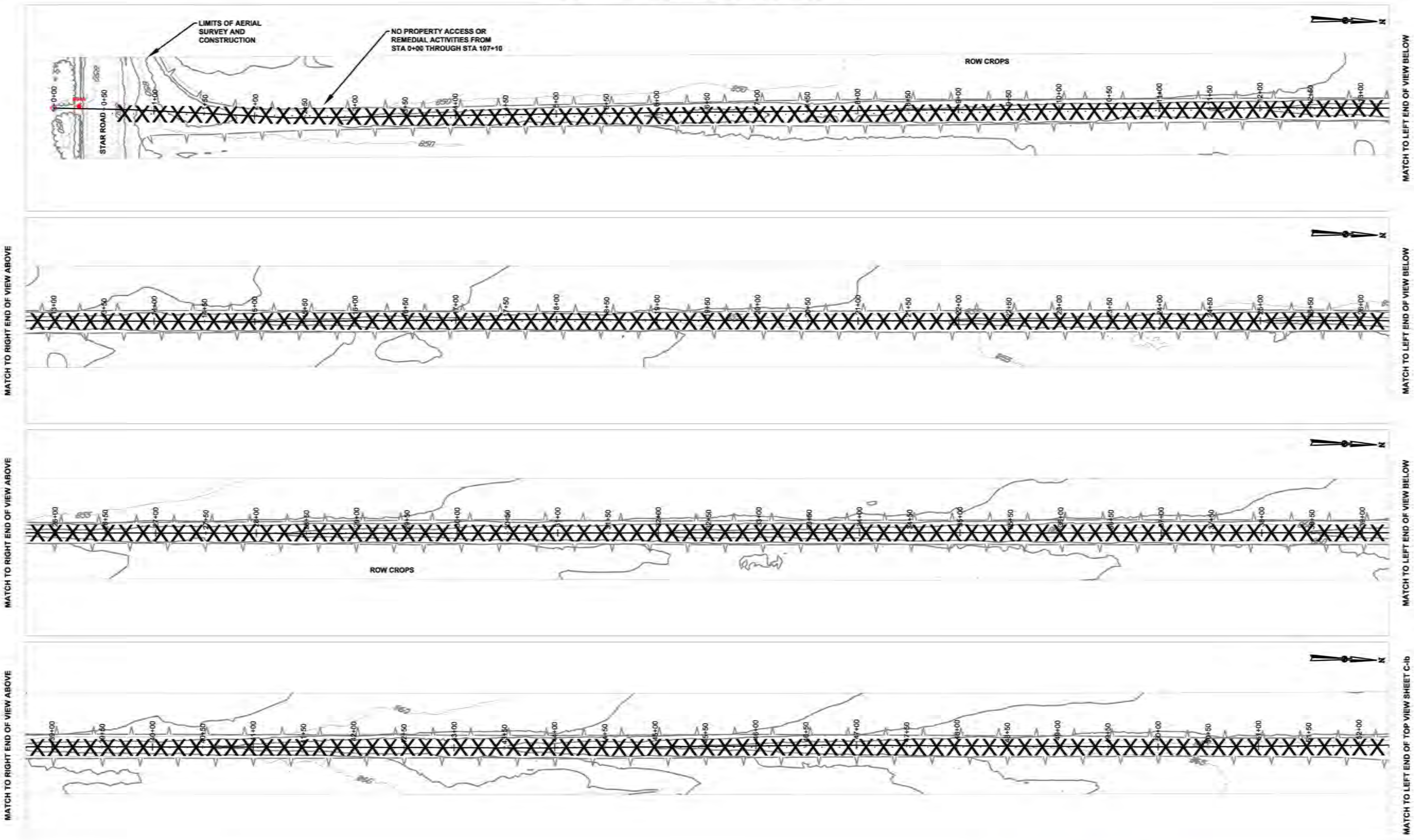
CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS

EXCAVATION AND RESTORATION PLAN
SEGMENT H4, STA 0+00 to 27+70

SHEET IDENTIFICATION
C-H4a

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Aligns_C-)All_Sites.dwg
SAVE DATE: Oct 17, 2018 3:22 PM BY: Cferguson PLOT DATE: Oct 17, 2018 4:26 PM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT I - STA 0+00 to 52+00



AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT ___ RECEIVES STORMWATER RUNOFF FROM ________. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR ___________.

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3. REFER TO THE NOTES ON SHEETS C-02 AND C-03 FOR ADDITIONAL INFORMATION.

SEGMENT LOCATION MAP

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

HGL

DESIGNED BY: C. FERGUSON
DWN BY: T. BRASWELL
CKD BY: A. FLETCHER
SUBMITTED BY: HGL
PLOT SCALE: 1"=50'
PLOT DATE:
SIZE: ANSI D
DATE: OCTOBER 2018
SOLICITATION NO.:
CONTRACT NO.: EP-S7-05-06 TO-0073
FILE NUMBER: EP0073
FILE NAME: C:\Users\cferguson\Documents\0073 Cherokee County... (Aligns_C-I)All_Sites.dwg

CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS
EXCAVATION AND RESTORATION PLAN
SEGMENT I, STA 0+00 to 52+00

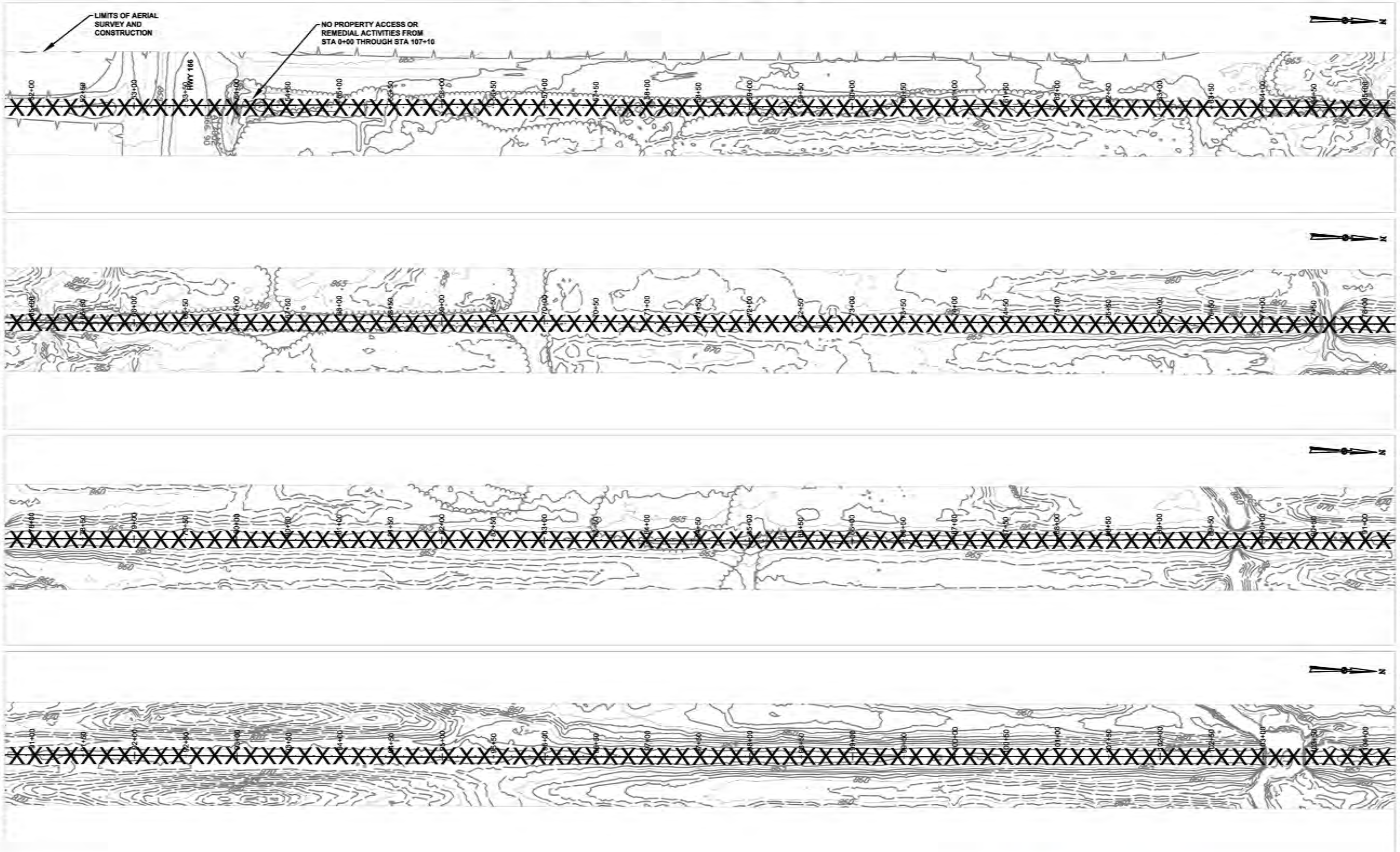
SHEET IDENTIFICATION
C-Ia

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Aligns_C-I)All_Sites.dwg
SAVE DATE: Oct 17, 2018 3:22 PM BY: Cferguson PLOT DATE: Oct 17, 2018 4:27 PM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT I - STA 52+00 to 104+00

MATCH TO RIGHT END OF BOTTOM VIEW SHEET C-Ib

MATCH TO LEFT END OF VIEW BELOW



MATCH TO RIGHT END OF VIEW ABOVE

MATCH TO LEFT END OF VIEW BELOW

MATCH TO RIGHT END OF VIEW ABOVE

MATCH TO LEFT END OF VIEW BELOW

MATCH TO RIGHT END OF VIEW ABOVE

MATCH TO LEFT END OF TOP VIEW SHEET C-Ic

AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT __ RECEIVES STORMWATER RUNOFF FROM ________. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR ________.

2. (*DISCUSS ACCESS, IF NEEDED, OR DELETE THIS NOTE*). CONTRACTOR SHALL MEET WITH THE PROPERTY OWNER AND EPA TO ESTABLISH THE LOCATION OF THE TEMPORARY ACCESS ROAD. THE ROAD AND EXISTING CHAT TRAIL SHALL BE REMOVED TO THE LIMITS OF CONSTRUCTION AS PART OF THE SITE RESTORATION ACTIVITIES

3. REFER TO THE NOTES ON SHEETS C-02 AND C-03 FOR ADDITIONAL INFORMATION.

SEGMENT LOCATION MAP

1" = 50'

25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR.

MARK	DESCRIPTION	DATE	APPR.

HGL

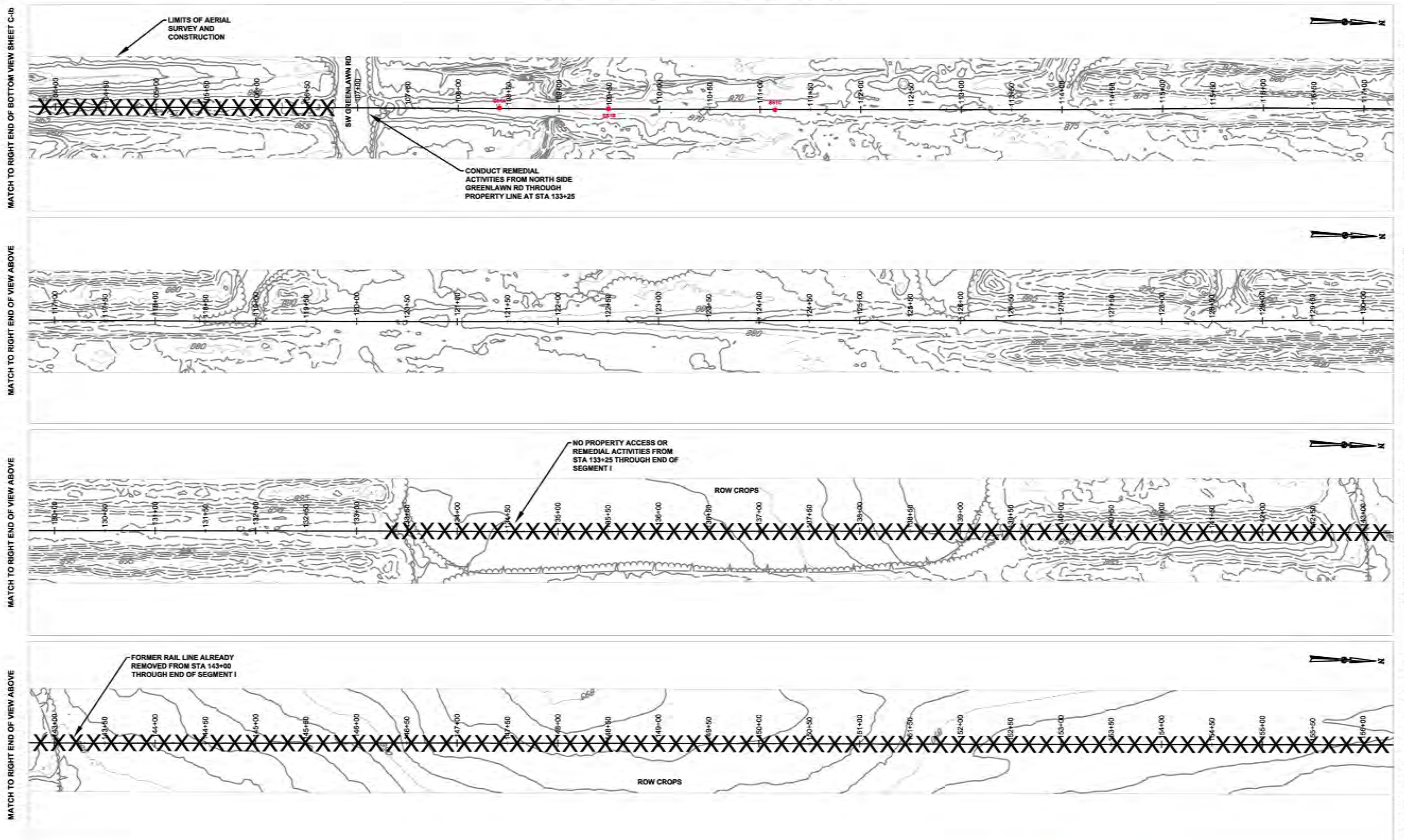
DESIGNED BY: C. FERGUSON | DATE: OCTOBER 2018
DWN BY: T. BRASWELL | CKD BY: A. FLETCHER | SOLICITATION NO.:
SUBMITTED BY: HGL | CONTRACT NO.: EP-S7-05-05 TO-0073
PLOT SCALE: 1"=50' | PLOT DATE: | FILE NUMBER: EP0073
SIZE: ANSI D | FILE NAME: C:\Users\cferguson\Documents\0073 Cherokee County...\Aligns_C-I)All_Sites.dwg

CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS
EXCAVATION AND RESTORATION PLAN
SEGMENT I, STA 52+00 to 104+00

SHEET IDENTIFICATION
C-Ib

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Aligns_C-I)All_Sites.dwg
SAVE DATE: Oct 17, 2018 3:22 PM BY: Cferguson PLOT DATE: Oct 17, 2018 4:28 PM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT I - STA 104+00 to 156+00



AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT __ RECEIVES STORMWATER RUNOFF FROM ________. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR __________.

2. (*DISCUSS ACCESS, IF NEEDED, OR DELETE THIS NOTE*). CONTRACTOR SHALL MEET WITH THE PROPERTY OWNER AND EPA TO ESTABLISH THE LOCATION OF THE TEMPORARY ACCESS ROAD. THE ROAD AND EXISTING CHAT TRAIL SHALL BE REMOVED TO THE LIMITS OF CONSTRUCTION AS PART OF THE SITE RESTORATION ACTIVITIES

3. REFER TO THE NOTES ON SHEETS C-02 AND C-03 FOR ADDITIONAL INFORMATION.

SEGMENT LOCATION MAP

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

DESIGNED BY: C. FERGUSON
DWN BY: T. BRASWELL
CKD BY: A. FLETCHER
SUBMITTED BY: HGL
PLOT SCALE: 1"=50'
PLOT DATE:
SIZE: ANSI D
DATE: OCTOBER 2018
SOLICITATION NO.:
CONTRACT NO.: EP-S7-05-05 TO-0073
FILE NUMBER: EP0073
FILE NAME: C:\Users\cferguson\Documents\0073 Cherokee County... (Aligns_C-I)All_Sites.dwg

HGL

CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS
EXCAVATION AND RESTORATION PLAN
SEGMENT I, STA 104+00 to 156+00

SHEET IDENTIFICATION
C-Ic

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Aligns_C-I)All_Sites.dwg
SAVE DATE: Oct 26, 2018 3:46 PM BY: Cferguson PLOT DATE: Oct 26, 2018 4:01 PM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

SEGMENT I - STA 156+00 to 160+77

MATCH TO RIGHT END OF BOTTOM VIEW SHEET C-Ic

AREA 1 SITE-SPECIFIC EXCAVATION & RESTORATION PLAN NOTES:
(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. AREA __ OF SEGMENT __ RECEIVES STORMWATER RUNOFF FROM ________. IT INCLUDES DISCONTINUOUS AREAS OF CHAT, TAILINGS, AND OTHER MINE WASTE MIXED WITH SOIL AND CONSTRUCTION DEBRIS. THE LOW-LYING AREAS AND DRAINAGE FEATURES ARE VEGETATED WITH BRUSH AND TREES. THESE AREAS ARE SUSPECTED TO CONTAIN MINE WASTE AND CONTAMINATED SOIL. THE SURROUNDING SITE PROPERTIES ARE USED FOR ________.

2. (*DISCUSS ACCESS, IF NEEDED, OR DELETE THIS NOTE*). CONTRACTOR SHALL MEET WITH THE PROPERTY OWNER AND EPA TO ESTABLISH THE LOCATION OF THE TEMPORARY ACCESS ROAD. THE ROAD AND EXISTING CHAT TRAIL SHALL BE REMOVED TO THE LIMITS OF CONSTRUCTION AS PART OF THE SITE RESTORATION ACTIVITIES.

3. REFER TO THE NOTES ON SHEETS C-02 AND C-03 FOR ADDITIONAL INFORMATION.

SEGMENT LOCATION MAP

1" = 50'
25 0 50

PRELIMINARY - NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

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MARK	DESCRIPTION	DATE	APPR

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PLOT SCALE: 1"=50'
PLOT DATE:
FILE NUMBER: EP0073
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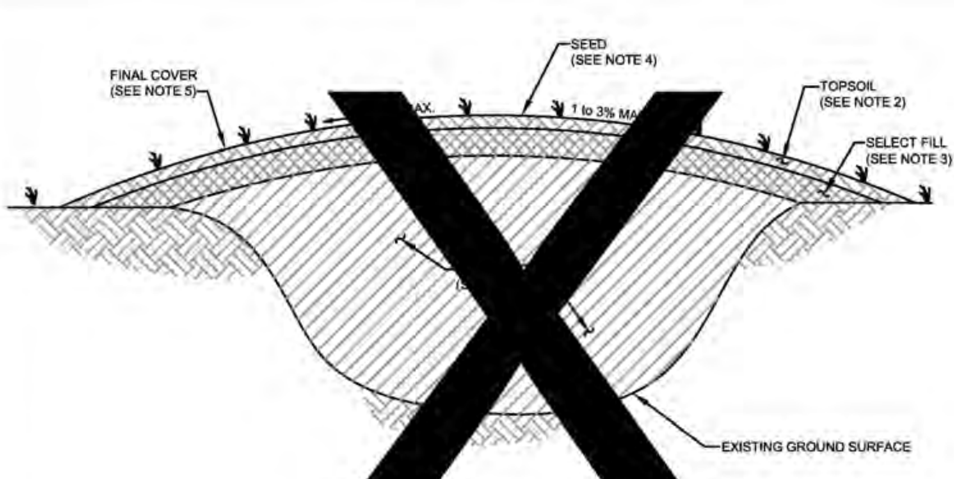
FILE NAME: C:\Users\cferguson\Documents\0073 Cherokee County ...(Aligns_C-I)All_Sites.dwg

HGL

CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS
EXCAVATION AND RESTORATION PLAN
SEGMENT I, STA 156+00 to 160+77

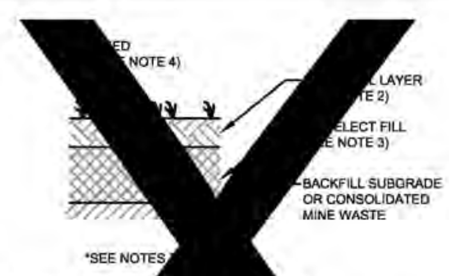
SHEET IDENTIFICATION
C-Id

DWG FILE: C:\Users\cferguson\Documents\0073 Cherokee County OU8 RRs\AutoCAD\(Aligns_C-I)All_Sites.dwg
SAVE DATE: Oct 26, 2018 3:46 PM BY: Cferguson PLOT DATE: Oct 26, 2018 4:02 PM BY: Ferguson, Chad
XREFS: Layout_Border CCRR basemap Mapping_Limits

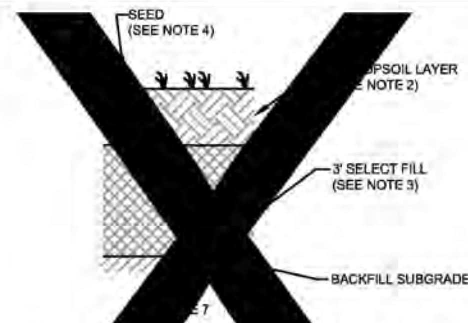


FINAL [redacted] SIDENCE PIT COV [redacted] TAIL (1 / CD-01)

N.T.S.



COVER SYST [redacted] E
(MINE WASTE C [redacted] LIDA [redacted] AREA) (2 / CD-01)

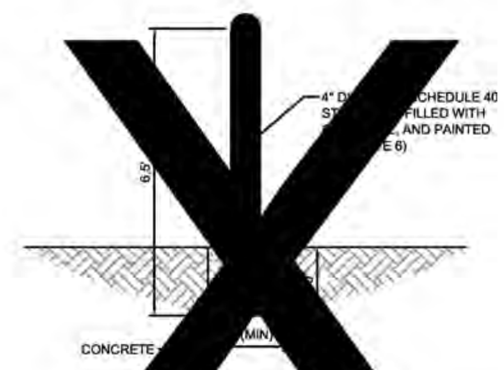


COVER SYSTE [redacted] OFILE ([redacted] CT AREAS
OUTSIDE OF MI [redacted] ASTE CONS [redacted] TION AREA) (3 / CD-01)

N.T.S.

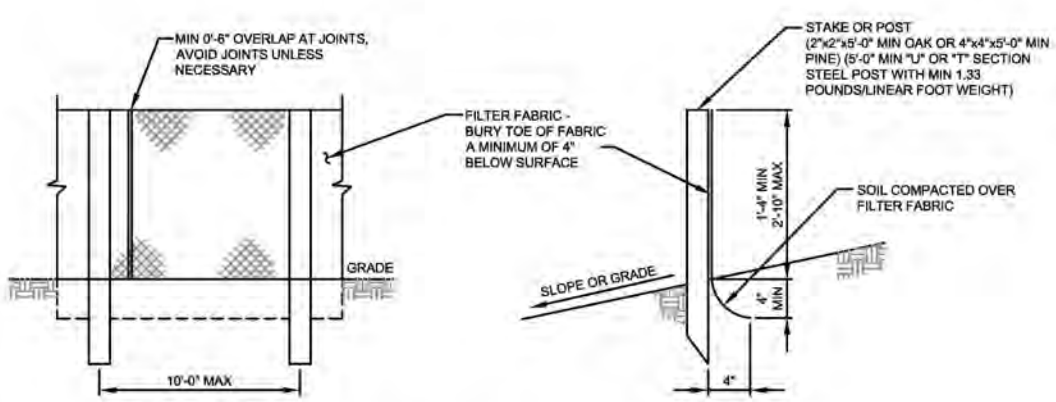
MINE WASTE C [redacted] OLIDATION [redacted] ORARY EDGE (4 / CD-01)

N.T.S.



MA [redacted] ANCE MONUM [redacted] (5 / CD-01)

N.T.S.



ELEVATION

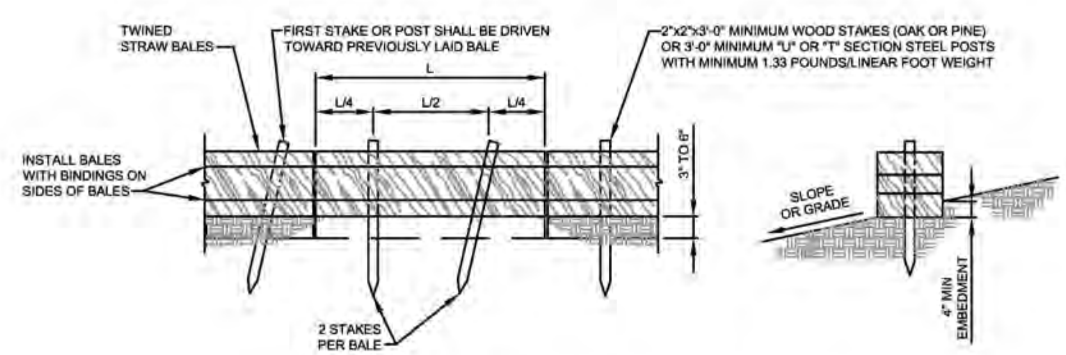
SECTION

SILT FENCE DETAIL (- / CD-01)

N.T.S.

*SEE NOTES 1 AND 9

SILT FENCE NOTE:
A PREASSEMBLED SILT FENCE MEETING THE REQUIREMENTS OF THIS DETAIL AND THE SPECIFICATION IS ACCEPTABLE IN LIEU OF A FIELD-CONSTRUCTED FENCE.



STRAW BALE DETAIL (- / CD-01)

N.T.S.

*SEE NOTES 1 AND 9

NOTES:

(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. CONSTRUCTION OF SILT FENCE AND STRAW BALES SHALL BE AS SPECIFIED IN SECTION 02910. A PREASSEMBLED SILT FENCE MEETING THE REQUIREMENTS OF THIS DETAIL AND THE SPECIFICATION IS ACCEPTABLE IN LIEU OF A FIELD-CONSTRUCTED FENCE.
2. TOPSOIL SHALL MEET THE REQUIREMENTS OF SECTION 02140.
3. SELECT FILL SHALL MEET THE REQUIREMENTS OF SECTION 02140.
4. SEED SHALL MEET THE REQUIREMENTS OF SECTION 02921.
5. MINE WASTE SHALL BE PLACED IN ACCORDANCE WITH SECTION 02111. PROVIDE A MINIMUM OF 90 DAYS BETWEEN INITIAL FILLING OF SUBSIDENCE PIT AND PLACEMENT OF FINAL COVER. CONTRACTOR SHALL REPAIR ANY AREAS OF SETTLEMENT THAT OCCURS DURING THE CONTRACT PERIOD BY PLACING ADDITIONAL TOPSOIL WITHIN THE AREAS OF SETTLEMENT AND RESEEDING.
6. MAINTENANCE MONUMENTS SHALL MEET THE REQUIREMENTS OF SECTION 02140.
7. THE COVER SYSTEM IN DETAIL 2 SHALL BE USED IN AREAS WHERE THE SUBSIDENCE PIT/MINE SHAFT IS LOCATED WITHIN THE FOOTPRINT OF A WASTE CONSOLIDATION AREA, SUCH AS AREAS 7 AND 8. FOR SUBSIDENCE PITS/MINE SHAFTS LOCATED OUTSIDE THE FOOTPRINT OF WASTE CONSOLIDATION AREAS, THE COVER SYSTEM SHOWN IN DETAIL 3 SHALL BE USED, ASSUMING THAT THE AREA WILL BE RETURNED TO AGRICULTURAL OR OTHERWISE UNRESTRICTED USE.
8. INCREASE THE TOTAL COVER THICKNESS TO 24" IN SELECT PORTIONS OF AREA 8 AS SHOWN ON SHEET C-14.
9. INDIVIDUAL EROSION CONTROL DEVICES MAY NOT BE SHOWN OR REFERENCED ON THE DRAWINGS, BUT ARE PRESENTED HERE TO PROVIDE VISUAL DETAIL. HOWEVER, THE CONTRACTOR IS STILL RESPONSIBLE FOR MEETING THE SPACING, INSTALLATION, AND OTHER CONSTRUCTION REQUIREMENTS LISTED FOR THE EROSION CONTROL MEASURES IN SECTION 02910.

PRELIMINARY
NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

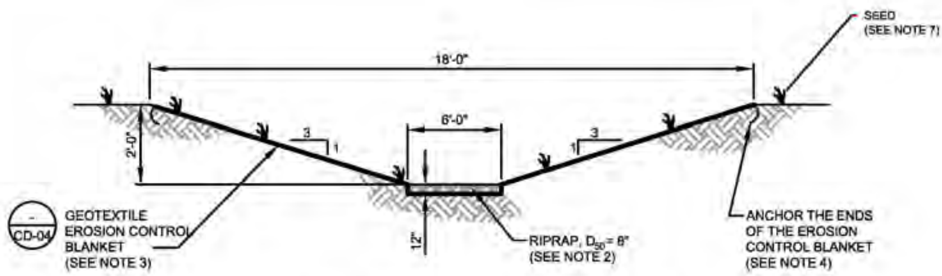
MARK	DESCRIPTION	DATE	APPR

DESIGNED BY: C.FERGUSON
DWN BY: C.FERGUSON | CKD BY: A.FLETCHER
SUBMITTED BY: HGL
PLOT SCALE: 1"=1' | PLOT DATE: 08oct2017
SIZE: ANSI D | FILE NAME: (CD-X)Details.dwg
DATE: OCTOBER 2018
SOLICITATION NO.:
CONTRACT NO.: EP-S7-05-05 TO-0073
FILE NUMBER: EPI073

CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS

CIVIL DETAILS 1

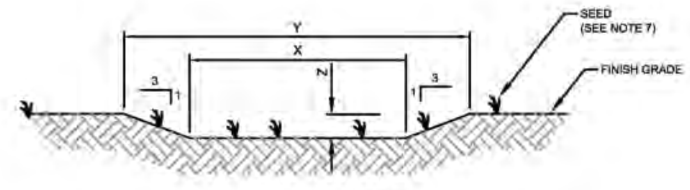
SHEET IDENTIFICATION
CD-01



ROCK-LINED DRAINAGE DITCH (1 / CD-02)

N.T.S.

NOTE: DIMENSIONS FOR THE DRAINAGE LETDOWNS AT AREA 7 ARE HEIGHT = 1' 0", BOTTOM WIDTH = 4' 0", TOP WIDTH = 10' 0". GEOTEXTILE FABRIC IS NOT REQUIRED ON THE SIDESLOPES OF THE LETDOWNS, ONLY UNDER THE RIPRAP AREA. MAINTAIN MINIMUM OF 12" OF SELECT FILL BETWEEN BOTTOM OF DITCH AND TOP OF BURIED MINE WASTE.

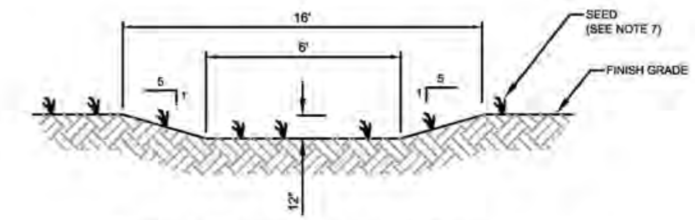


GRASS-LINED DRAINAGE DITCH (2 / CD-02)

N.T.S.

DITCH LOCATION	X	Y	Z *
YOUNGMAN AVENUE (AREA 7)	3'	9'	1'
W NORTH 4TH STREET (AREA 7)	4'	13'	1.5'

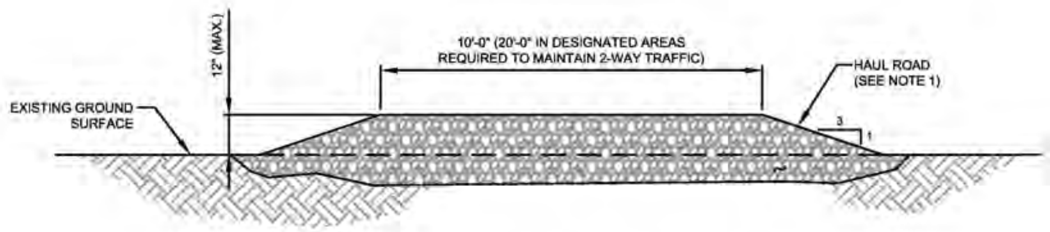
* Z HEIGHT IS MINIMUM ALLOWABLE



GRASS-LINED DRAINAGE SWALE (3 / CD-02)

N.T.S.

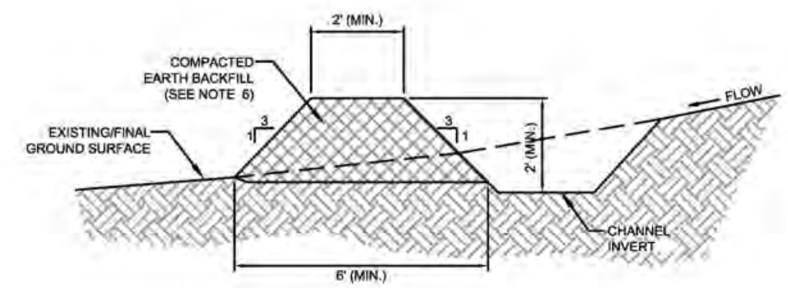
NOTE: MAINTAIN MINIMUM DISTANCE OF 10 FEET BETWEEN EDGE OF WASTE CONSOLIDATION AREA AND EDGE OF DRAINAGE SWALES.



TEMPORARY ACCESS/HAUL ROAD DETAIL (4 / CD-02)

N.T.S.

* SEE NOTE 8

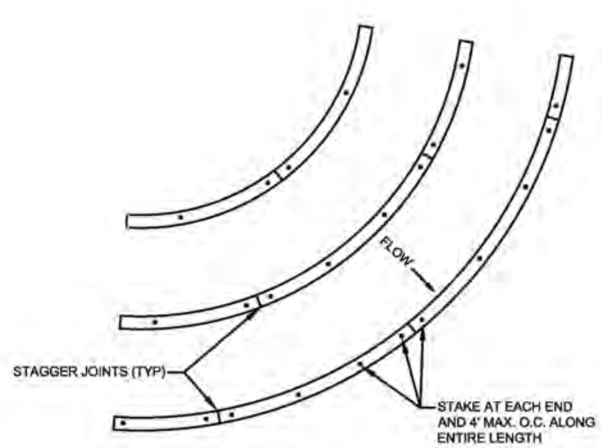


EARTH BERM/DITCH DETAIL (5 / CD-02)

N.T.S.

* SEE NOTE 8

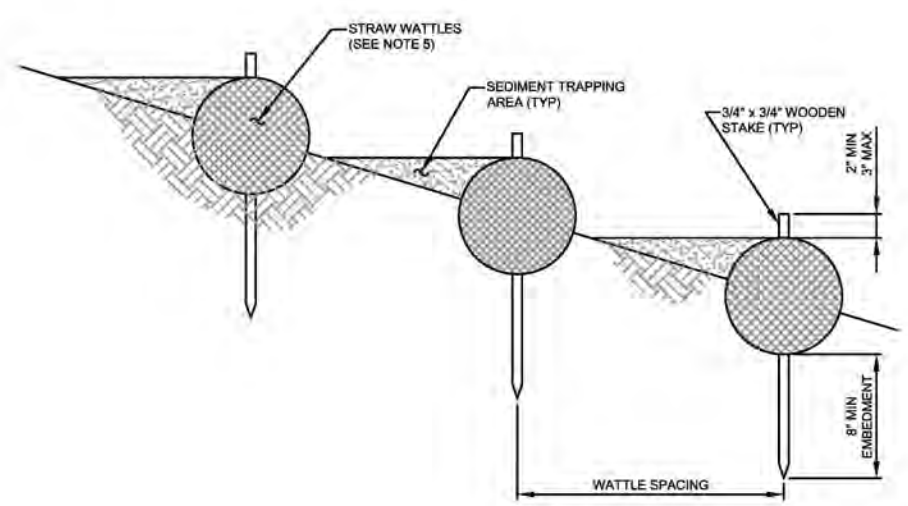
NOTE: DECREASE HEIGHT TO 12-INCHES FOR DRAINAGE TERRACES AT AREA 7 WASTE CONSOLIDATION AREA. COVER WITH TOPSOIL, SEED, AND MULCH AS DESCRIBED IN SECTION 02921. INSTALL STRAW BALES IN TERRACE FLOW LINE AS DESCRIBED IN SECTION 02910.



STRAW WATTLE - PLAN VIEW (- / CD-02)

N.T.S.

* SEE NOTE 8



STRAW WATTLE - ELEVATION VIEW (- / CD-02)

N.T.S.

* SEE NOTE 8

NOTES:

(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. TEMPORARY ACCESS AND HAUL ROADS SHALL BE CONSTRUCTED IN ACCORDANCE WITH SECTION 02121.
2. RIPRAP SHALL CONFORM TO THE REQUIREMENTS OF SECTION 02209.
3. EROSION CONTROL BLANKET SHALL CONFORM TO THE REQUIREMENTS OF SECTION 02910.
4. ANCHOR EROSION CONTROL BLANKET IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.
5. WATTLES SHALL CONFORM TO SECTION 02910. INSTALL WATTLES IN ACCORDANCE WITH SECTION 02910. PERFORM MAINTENANCE IN ACCORDANCE WITH SECTION 02910. WATTLES SHALL BE INSPECTED REGULARLY, AND IMMEDIATELY AFTER A RUNOFF PRODUCING RAINFALL, TO ENSURE THEY REMAIN THOROUGHLY ENTRENCHED AND IN CONTACT WITH THE SOIL.
6. COMPACTED EARTH BACKFILL SHALL CONSIST OF SELECT FILL AS SPECIFIED IN SECTION 02300.
7. SEED SHALL MEET THE REQUIREMENTS OF SECTION 02921.
8. INDIVIDUAL EROSION CONTROL DEVICES MAY NOT BE SHOWN OR REFERENCED ON THE DRAWINGS, BUT ARE PRESENTED HERE TO PROVIDE VISUAL DETAIL. HOWEVER, THE CONTRACTOR IS STILL RESPONSIBLE FOR MEETING THE SPACING, INSTALLATION, AND OTHER CONSTRUCTION REQUIREMENTS LISTED FOR THE EROSION CONTROL MEASURES IN SECTION 02910.

PRELIMINARY
NOT FOR CONSTRUCTION

U.S. Environmental Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

HGL

DESIGNED BY: C.FERGUSON
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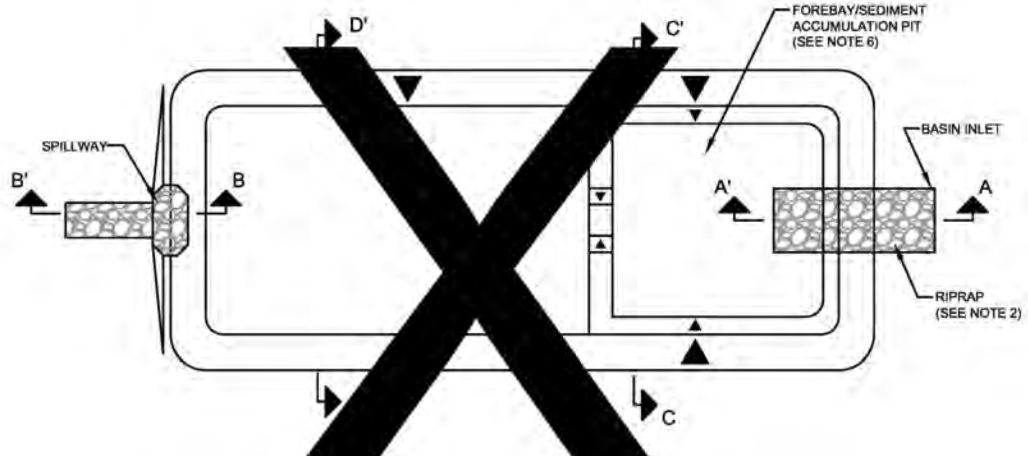
CKD BY: A.FLETCHER
SUBMITTED BY: HGL
PLOT SCALE: 1"=1'
PLOT DATE: 08oct2017
SIZE: ANSI D
FILE NAME: (CD-X)Details.dwg
DATE: OCTOBER 2018
SOLICITATION NO.:
CONTRACT NO.: EP-S7-05-05 TO-0073
FILE NUMBER: EP9073

CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS

CIVIL DETAILS 2

SHEET IDENTIFICATION
CD-02



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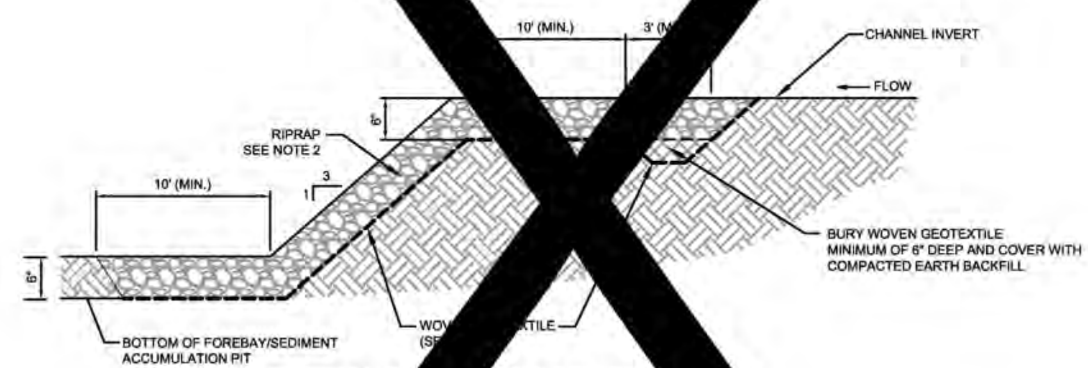

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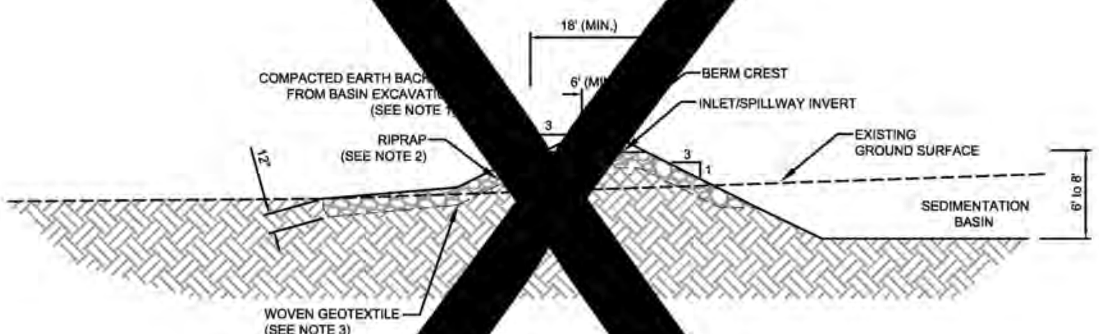
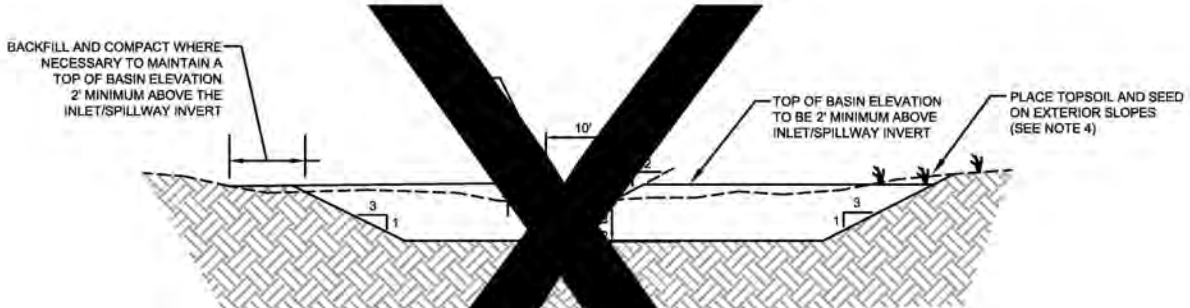


N.T.S.

N.T.S.



TYPICAL SEDIMENTATION BASIN PROFILE D-D'

N.T.S.

NOTES:

(REFER TO SPECIFICATIONS FOR ADDITIONAL INFORMATION)

1. COMPACTED EARTH BACKFILL SHALL CONSIST OF SELECT FILL AS SPECIFIED IN SECTION 02300.

2. xxxx

3. xxxx

PRELIMINARY
NOT FOR CONSTRUCTION

U.S. Environmental
Protection Agency
Region 7
Lenexa, Kansas

MARK	DESCRIPTION	DATE	APPR

MARK	DESCRIPTION	DATE	APPR

HGL

DESIGNED BY: C.FERGUSON		DATE: OCTOBER 2018
DWN BY: C.FERGUSON	CKD BY: A.FLETCHER	SOLICITATION NO.:
SUBMITTED BY: HGL		CONTRACT NO.: EP-S7-05-05 TO-0073
PLOT SCALE: 1"=1'	PLOT DATE: 08/xx/2017	FILE NUMBER: EP8073
SIZE: ANSI D	FILE NAME: (CD-X)Details.dwg	

CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 - RAILROADS
REMEDIAL DESIGN
CHEROKEE COUNTY, KANSAS

CIVIL DETAILS 3

SHEET IDENTIFICATION
CD-03

ATTACHMENT 2
QUANTITY ESTIMATES

Cherokee County OU8 Railroads
Mining Waste and Embankment Volume Estimate

SEGMENT A - South Section

Station (ft)		Thickness (ft)		Width (ft)		Volume	Volume	Notes
Start	Stop	Start	Stop	Start	Stop	cf	cy	*(# = clear at depth)*
0	150	0	0	0	0	0	0	No rail line
150	1,470	1	1	30	30	39,600	1,467	Breaks at Willow Ave; TP13D 18'x0'x12"
1,470	1,510	0	0	0	0	0	0	Pavement
1,510	2,400	1	3	40	50	80,100	2,967	TP13C 30'x0x36"; TP13B 50'x0'x12"; TP13A 48"
2,400	4,600	3	7	50	60	605,000	22,407	
4,600	6,200	7	6	60	70	676,000	25,037	
6,200	7,035	6	3	70	50	225,450	8,350	TP32B 18'x2xClear; TP32A 24'x5'x24"
7,035	7,185	0	0	0	0	0	0	W North 10th St
7,185	8,260	2	2	50	50	107,500	3,981	TP33A/B 18'x3'x24"
8,260	8,740	0	0	0	0	0	0	
8,740	9,300	3	2	35	40	52,500	1,944	
9,300	9,900	0	0	0	0	0	0	Breaks at Cougar Dr
9,900	11,800	1.5	4	40	50	235,125	8,708	
11,800	12,200	4	1.5	50	40	49,500	1,833	
12,200	13,550	2	9	40	60	371,250	13,750	
13,550	13,770	0	0	0	0	0	0	Brush Creek
13,770	14,100	15	15	80	80	396,000	14,667	
14,100	18,200	0	0	0	0	0	0	No access
18,200	18,250	0	0	0	0	0	0	Beasley Road
18,250	18,600	3	2.5	50	40	43,313	1,604	
18,600	19,350	2.5	3	40	50	92,813	3,438	#35 clear at 30"
19,350	20,050	3	3	40	50	94,500	3,500	Railbed up to 7' high
20,050	20,500	3	3	50	40	60,750	2,250	
20,500	21,100	2.5	2.5	40	50	67,500	2,500	#36 at 30"
21,100	21,350	0	0	0	0	0	0	No access
21,350	29,860	0	0	0	0	0	0	
29,860	31,150	2	2	40	40	103,200	3,822	TP23A/B 24"
31,150	31,880	0	0	0	0	0	0	No access
31,880	32,240	1	1	40	40	14,400	533	End at SE Tiger Rd
32,240	32,375	0	0	0	0	0	0	No access
32,375	36,750	1	1	40	40	175,000	6,481	
36,750	44,190	0	0	0	0	0	0	No access
44,190	46,110	1	1	40	40	76,800	2,844	#38 clear
46,110	46,995	1	1	40	40	35,400	1,311	#39 clear
46,995	47,045	0	0	0	0	0	0	SE Messer Road
47,045	49,875	0	0	0	0	0	0	No rail line and/or access
49,875	51,210	3	2	40	40	133,500	4,944	
51,210	55,300	0	0	0	0	0	0	No rail line and/or access; #40 at 12"
						3,735,200	**138,341**	

Cherokee County OU8 Railroads
Mining Waste and Embankment Volume Estimate

SEGMENT A - North Section

Station (ft)		Thickness (ft)		Width (ft)		Volume	Volume	Notes
Start	Stop	Start	Stop	Start	Stop	cf	cy	
55,275	55,775	2	3	50	50	62,500	2,315	
55,775	56,025	0	0	0	0	0	0	No rail line
56,025	57,150	1	1.5	60	60	84,375	3,125	
57,150	57,850	1.5	1	60	50	48,125	1,782	#41 clear
57,850	58,330	1	2	50	60	39,600	1,467	TP16A/B clear
58,330	58,370	0	0	0	0	0	0	Highway 96
58,370	59,375	2	1	60	50	82,913	3,071	Ends at row crops
59,375	61,200	0	0	0	0	0	0	Row crops
61,200	62,200	2	3	40	50	112,500	4,167	
62,200	63,500	3	1.5	50	60	160,875	5,958	
63,500	64,040	1.5	1	60	40	33,750	1,250	#42 clear
64,040	65,075	1	1	40	50	46,575	1,725	Pavement/row crops
65,075	65,875	1	1	50	50	40,000	1,481	
65,875	69,300	1	3	50	50	342,500	12,685	
69,300	69,675	0	0	0	0	0	0	No rail line
69,675	69,975	1	2	40	50	20,250	750	
69,975	70,850	5	6	60	80	336,875	12,477	
70,850	71,300	6	3	80	80	162,000	6,000	
71,300	71,675	6	13	80	100	320,625	11,875	
71,675	71,760	0	0	0	0	0	0	Cow Creek
71,760	73,850	14	12	110	90	2,717,000	100,630	Access not verified this segment
73,850	76,050	12	8	90	80	1,870,000	69,259	#44 clear but railbed +12' high
76,050	76,225	0	0	0	0	0	0	Pasture
76,225	76,660	1	1	40	40	17,400	644	

SEGMENT A - North Section (continued)

Station (ft)		Thickness (ft)		Width (ft)		Volume	Volume	Notes
Start	Stop	Start	Stop	Start	Stop	cf	cy	
76,660	77,350	4	7	40	50	170,775	6,325	
77,350	77,775	7	3	50	60	116,875	4,329	
77,775	78,725	1.5	1	60	40	59,375	2,199	TP13 9'x3'x18"
78,725	78,775	0	0	0	0	0	0	NE 107th St
78,775	79,100	1	1	50	40	14,625	542	TP14 25'x0'x12"
79,100	79,150	0	0	0	0	0	0	Lawton Road
79,150	81,300	1	2	50	60	177,375	6,569	TP15A/B 9'x2'x12"
81,300	82,410	2	2	60	60	133,200	4,933	
82,410	83,700	1	1	60	60	77,400	2,867	#45 clear
83,700	86,900	1	2	60	70	312,000	11,556	#46 clear
86,900	87,900	3	3	70	60	195,000	7,222	
87,900	88,600	3	1	60	50	77,000	2,852	
						7,831,488	**290,055**	

SEGMENT B

Station (ft)		Thickness (ft)		Width (ft)		Volume	Volume	Notes
Start	Stop	Start	Stop	Start	Stop	cf	cy	
0		0	0	0	0	0	0	
0	700	8	4	90	70	336,000	12,444	
700	2,350	4	4	70	70	462,000	17,111	
2,350	2,900	4	6	70	80	206,250	7,639	
2,900	3,100	6	2	80	60	56,000	2,074	
3,100	4,060	0	0	0	0	0	0	Rail line already removed; TP24A at 12"; TP24B 12'x0'x36"
4,060	4,135	0	0	0	0	0	0	Hwy 69
4,135	5,150	3.5	4.5	90	100	385,700	14,285	TP25A 18'x2'x42"; TP25B 20'x4'x42"
5,150	5,960	4.5	2	100	100	263,250	9,750	
5,960	7,875	2	8	100	110	1,005,375	37,236	
7,875	7,950	0	0	0	0	0	0	Bridge
7,950	8,090	2	2	60	70	18,200	674	
8,090	9,410	10	7	70	60	729,300	27,011	Breaks at SE 80th St; TP26A 22'x4'x42"
9,410	9,470	0	0	0	0	0	0	Pavement
9,470	11,475	7	5	80	70	902,250	33,417	TP27A/B 23'x4'x42"
11,475	12,150	5	2	70	60	153,563	5,688	
12,150	12,990	2	3	60	50	115,500	4,278	
12,990	13,450	3	2	50	50	57,500	2,130	
13,450	13,900	2	3	50	60	61,875	2,292	
13,900	14,800	3	1	60	50	99,000	3,667	Breaks at SE 90th St; TP28A/B 21'x3'x30"
14,800	14,860	0	0	0	0	0	0	Pavement
14,860	16,200	2	4	60	90	301,500	11,167	TP29 18'x3'x+48"
16,200	17,125	4	1	90	90	208,125	7,708	
17,125	20,290	1	2	90	80	403,538	14,946	Breaks at SE 100th St; TP30B 23'x3'x30"
20,290	20,350	2	2	80	70	9,000	333	Pavement
20,350	20,800	2	4	70	80	101,250	3,750	TP31A 16'x3'x42"
20,800	21,275	4	9	80	90	262,438	9,720	
21,275	21,700	9	2	90	70	187,000	6,926	
21,700	24,975	0	0	0	0	0	0	No access
24,975	25,130	0	0	0	0	0	0	Spring River
25,130	29,765	0	0	0	0	0	0	No access; end at SE 118th St
						6,324,613	**234,245**	

SEGMENT C

Station (ft)		Thickness (ft)		Width (ft)		Volume	Volume	Notes
Start	Stop	Start	Stop	Start	Stop	cf	cy	
0	5,500	0	0	0	0	0	0	No access; #56 - clear
5,500	5,750	1	1	40	50	11,250	417	
5,750	6,300	3	5	50	90	154,000	5,704	
6,300	6,600	5	4	90	80	114,750	4,250	#51 at 30"
6,600	7,375	4	4	80	80	248,000	9,185	SE Clem Road
7,375	8,100	4	3	80	90	215,688	7,988	
8,100	8,500	3	4	90	100	133,000	4,926	
8,500	8,850	4	3	100	80	110,250	4,083	#50 - clear
8,850	9,225	4.5	4.5	80	70	126,563	4,688	3-6-3
9,225	9,425	7.5	4.5	70	110	108,000	4,000	5-16-5
9,425	10,100	4.5	2	110	60	186,469	6,906	
10,100	11,300	4	2	60	80	252,000	9,333	#49 - clear
11,300	11,750	3	3	80	90	114,750	4,250	
11,750	12,450	3	3	90	80	178,500	6,611	
12,450	12,870	3	2.5	80	80	92,400	3,422	TP22A @ 30"
12,870	12,900	0	0	0	0	0	0	SE Messer Rd
12,900	14,350	2.5	2	80	50	212,063	7,854	TPA/B/C @ 30"
14,350	16,700	2	0.5	50	50	146,875	5,440	#48 - clear
16,700	18,325	0.5	0.5	50	60	44,688	1,655	#47 - clear
						2,449,244	**90,713**	

SEGMENT D - North Section

Station (ft)		Thickness (ft)		Width (ft)		Volume	Volume	Notes
Start	Stop	Start	Stop	Start	Stop	cf	cy	
0	36,350	0	0	0	0	0	0	BNSF Property - No access

SEGMENT D - South Section

Station (ft)		Thickness (ft)		Width (ft)		Volume	Volume	Notes
Start	Stop	Start	Stop	Start	Stop	cf	cy	
0	5,250	0	0	0	0	0	0	BNSF Property - No access

SEGMENT E

Station (ft)		Thickness (ft)		Width (ft)		Volume	Volume	Notes
Start	Stop	Start	Stop	Start	Stop	cf	cy	
0	5,475	0	0	0	0	0	0	No access; #56 - clear
5,475	6,000	0	9	50	50	118,125	4,375	
6,000	6,565	9	0	50	40	114,413	4,238	
6,565	6,860	0	0	0	0	0	0	No access; #55 - clear
6,860	8,225	0	0	0	0	0	0	Begins at SE 90th St / No access; #54 - @ 24"
8,225	8,550	7	1	50	60	71,500	2,648	
8,550	8,940	1	6	60	50	75,075	2,781	
8,940	10,600	0	0	0	0	0	0	No access; #53 @ 12"
						379,113	**14,041**	

SEGMENT F

Station (ft)		Thickness (ft)		Width (ft)		Volume	Volume	Notes
Start	Stop	Start	Stop	Start	Stop	cf	cy	
0	4,000	0	0	0	0	0	0	No access

SEGMENT H1

Station (ft)		Thickness (ft)		Width (ft)		Volume	Volume	Notes
Start	Stop	Start	Stop	Start	Stop	cf	cy	
0	2,730	0	0	0	0	0	0	No access
2,730	3,300	6	3	60	50	141,075	5,225	
3,300	3,600	3	1.5	50	50	33,750	1,250	
3,600	4,950	1.5	1.5	50	50	101,250	3,750	TP10ABC 14'x2'x18"; Ends at Ballard Ave
4,950	5,510	1.5	2.5	50	40	50,400	1,867	No rail line; TP11A 40'x0'x30"
5,510	5,560	0	0	0	0	0	0	W 30th Street
5,560	8,350	1	1	50	50	139,500	5,167	
8,350	8,500	1	3	50	70	18,000	667	
8,500	8,675	3	1	70	50	21,000	778	
8,675	8,850	1	1	50	50	8,750	324	Ends at existing RR
						513,725	**19,027**	

SEGMENT H2

Station (ft)		Thickness (ft)		Width (ft)		Volume	Volume	Notes
Start	Stop	Start	Stop	Start	Stop	cf	cy	
0	640	0	0	0	0	0	0	Addressed by other OU
640	2,050	2	2	0	0	0	0	TP12A 36'x0'x24"; TP12B 14'x0'x30"
2,050	3,700	2	1	50	50	123,750	4,583	
3,700	4,085	1	3.5	50	60	47,644	1,765	
4,085	4,550	0	0	0	0	0	0	No access; Ends at RR ROW
						171,394	**6,348**	

SEGMENT H3

Station (ft)		Thickness (ft)		Width (ft)		Volume	Volume	Notes
Start	Stop	Start	Stop	Start	Stop	cf	cy	
0	1,180	0	0	0	0	0	0	No access
1,180	1,665	0	0	0	0	0	0	No access
1,665	1,990	0	0	0	0	0	0	No access
						0	**0**	

SEGMENT H4

Station (ft)		Thickness (ft)		Width (ft)		Volume	Volume	Notes
Start	Stop	Start	Stop	Start	Stop	cf	cy	
100	1,710	1	1	40	40	64,400	2,385	Begin at SL Road
1,710	2,690	0	0	0	0	0	0	No access
						64,400	**2,385**	

SEGMENT I

Station (ft)		Thickness (ft)		Width (ft)		Volume	Volume	Notes
Start	Stop	Start	Stop	Start	Stop	cf	cy	
65	5,350	0	0	0	0	0	0	Start at Star Road / No access / TP8A 14'x2'x48+"
5,350	10,715	0	0	0	0	0	0	Hwy 166 / No access
10,715	10,875	1	2	50	50	12,000	444	Start at Greenlawn Road; TP1A 13'x2'x24"
10,875	11,350	2	3	50	50	59,375	2,199	TP1B/C 13'x2'x36"
11,350	11,700	3	2	50	50	43,750	1,620	
11,700	11,950	2	1	50	50	18,750	694	
11,950	12,600	1	2	50	60	53,625	1,986	
12,600	13,325	2	5	60	80	177,625	6,579	
13,325	16,030	0	0	0	0	0	0	No access
						365,125	**13,523**	

Cherokee County OU8 Railroads
Mining Waste and Embankment Volume Estimate

Cherokee County Superfund Site: OU8 Railroad Sites EP9073
Preliminary Design - Quantity Estimates

	Total Segment Length (ft)	Total Segment Length (mi)	Length w/ Access (ft)	Total Length w/ Access (mi)	L x 50' width (sf)	Disturbed Area (ac)	Etimated Waste Vol (CY)	Etimated Backfill Vol (CY)	Etimated Topsoil Vol (CY)	One Way Average Haul Distance (mi)
SEGMENT A - South Section	55,300	10.5	35,725	6.8	1,786,250	41.0	138,341	27,668	8,270	24
SEGMENT A - North Section	33,325	6.3	32,700	6.2	1,635,000	37.5	290,055	58,011	7,569	36
SEGMENT B	29,765	5.6	21,855	4.1	1,092,750	25.1	234,245	46,849	5,059	32
SEGMENT C	18,325	3.5	12,825	2.4	641,250	14.7	90,713	18,143	2,969	27
SEGMENT D - North Section	36,350	6.9	0	0.0	0	0.0	0	0	0	--
SEGMENT D - South Section	5,250	1.0	0	0.0	0	0.0	0	0	0	--
SEGMENT E	10,600	2.0	1,805	0.3	90,250	2.1	14,041	2,808	418	25
SEGMENT F	4,000	0.8	0	0.0	0	0.0	0	0	0	--
SEGMENT H1	8,850	1.7	6,120	1.2	306,000	7.0	19,027	3,805	1,417	3
SEGMENT H2	4,550	0.9	4,085	0.8	204,250	4.7	6,348	1,270	946	4
SEGMENT H3	1,990	0.4	0	0.0	0	0.0	0	0	0	--
SEGMENT H4	2,690	0.5	1,710	0.3	85,500	2.0	2,385	477	396	3
SEGMENT I	16,030	3.0	2,675	0.5	133,750	3.1	13,523	2,705	619	17
		43.0	**119,500**	**22.6**	**5,975,000**	**137.2**	**808,678**	**161,736**	**27,662**	

Notes:
1. Estimated backfill volume is assumed to be 20% of the excavated volume of waste material.
2. Estimated topsoil volume is assumed to be a 6-inch layer over 25% of the disturbed area.

Abbreviations:
ac = acre
CY = cubic yard
ft = feet
mi = mile
SY = square yard

ATTACHMENT 3
CONSTRUCTION COST ESTIMATE

TOTAL PROJECT COST TABLE

Cherokee County Superfund Site

Operable Unit 8 - Railroads

Cherokee County, Kansas

Item	Description	Project Cost[1,2]
01	Work Element 01 - General Requirements	$128,213
02	SEGMENT A	$15,502,238
03	SEGMENT B	$8,178,328
04	SEGMENT C	$3,230,922
05	SEGMENT E	$534,852
06	SEGMENT H1	$539,204
07	SEGMENT H2	$219,361
09	SEGMENT H4	$103,027
10	SEGMENT I	$426,280
11		
	Total	**$28,862,424**

Overall Cost ($/BCY):	**$35.69**

Notes:

1. The Project Cost includes an escalation of 1.35% and a contingency of 10%.

2. The costs presented in this estimate are considered Class 1 with an accuracy range of +10%/-5% of actual cost according to the AASTM International Standard Classification for Cost Estimate Classification System (Designation E 2516-06). This cost estimate is an Opinion of Probable Construction Cost only, as defined by the documents provided at the level of design indicated. HydroGeoLogic, Inc. (HGL) has no control over the cost of labor, materials, equipment, or services furnished, over schedules, over contractor's methods of determining prices, market or negotiating conditions. HGL does not guarantee that this opinion will not vary from actual cost.

Assumptions:

1. Temporary access/haul roads occur at 1 per 2 miles of segment.
2. Construction survey rate is 1 day per 2 miles of segment (min 1/2 day). Final surveys occur at double that rate (min
3. Silt fence is installed along 20% of the project length.
4. Twenty-five percent of the disturbed work are will require clearing and grubbing.
5. Haul distances were estimated from the center of each segment.
6. Finish grading will occur over 75% of the disturbed area.
7. Restoration erosion control items will be installed at half the rate used during site preparation.
8. Inspection and maintenance occurs at a rate of one unit per 2 miles of segment.

Abbreviations:

ac = acre
CY = cubic yard
ft = feet
mi = mile
SY = square yard

TOTAL PROJECT COST TABLE

Cherokee County Superfund Site

Operable Unit 8 - Railroads

Cherokee County, Kansas

Work Element 01 - General Requirements

Item	Description	Estimated Quantity	Unit of Measure	Unit Cost	Contract Cost	Contingency[1] 10%	Escalation[2] 1.35%	Project Cost[3]	Notes
01 - Mobilization and Demobilization					**$50,005**	**$5,001**	**$743**	**$55,748**	
01	Mobilization	1	LS	$25,000	$25,000	$2,500	$371	$27,871	
02	Demobilization	1	LS	$25,000	$25,000	$2,500	$371	$27,871	
03	Site Cleanup	1	LS	$5	$5	$1	$0	$6	
02 - Submittals					**$65,000**	**$6,500**	**$965**	**$72,465**	
04	Plans and Submittals	1	LS	$65,000	$65,000	$6,500	$965	$72,465	
				Total:	**$115,005**	**$11,501**	**$1,708**	**$128,213**	

Note:

1. The contingency of 10% reflects the unknown costs associated with constructing a given project, such as adverse weather conditions, materials costs, or unfavorable market conditions.
2. The escalation of 1.35% reflects cost increases from the date of estimate preparation to assumed midpoint of construction.
3. The Project Cost includes an escalation of 1.35% and a contingency of 10%.

TOTAL PROJECT COST TABLE

Cherokee County Superfund Site

Operable Unit 8 - Railroads

Cherokee County, Kansas

SEGMENT A

Item	Description	Estimated Quantity	Unit of Measure	Unit Cost	Contract Cost	Contingency[1] 10%	Escalation[2] 1.35%	Project Cost[3]	Notes
01 - Initial Activities					**$132,152**	**$13,215**	**$1,962**	**$147,329**	
01	Temporary Access/Haul Road Improvements	6.5	EA	$4,500	$29,158	$2,916	$433	$32,507	
02	XRF Grid Survey	2,737	EA	$37.63	$102,993	$10,299	$1,529	$114,822	
02 - Site Preparation					**$116,846**	**$11,685**	**$1,735**	**$130,265**	
03	Construction Survey and Staking	6.5	DY	$1,104	$7,151	$715	$106	$7,972	
	Temporary Erosion and Sediment Control - Pre-Construction								
04	Silt Fence	13,685	LF	$1.58	$21,622	$2,162	$321	$24,106	
05	Straw Bales	1,369	LF	$13.46	$18,427	$1,843	$274	$20,543	
06	Inspection and Maintenance	6.0	LS	$4,365	$26,191	$2,619	$389	$29,199	
07	Temporary Sedimentation Basin		LS	$22,747	$0	$0	$0	$0	
08	Clearing and Grubbing	29.4	AC	$1,476	$43,455	$4,345	$645	$48,445	
03 - Earthwork					**$10,907,642**	**$1,090,764**	**$161,978**	**$12,160,385**	
	Mining/Railroad Embankment Waste and Contaminated Soil								
09	Excavation and Loading	428,396	BCY	$7.22	$3,093,018	$309,302	$45,931	$3,448,251	
10	Hauling (assume 48 mile cycle)	428,396	BCY	$14.29	$6,120,920	$612,092	$90,896	$6,823,907	
11	Placement and Rough Grading at Sunflower Pit	428,396	BCY	$3.61	$1,546,509	$154,651	$22,966	$1,724,126	
12	Confirmation Sampling	2,737	EA	$53.78	$147,196	$14,720	$2,186	$164,101	
04 - Restoration					**$2,748,584**	**$274,858**	**$40,816**	**$3,064,259**	
	Import and Place Fill from Off-Site Borrow Sources								
	General Restoration								
13	Select Fill	85,679	ECY	$13.22	$1,132,679	$113,268	$16,820	$1,262,767	
14	Top Soil	15,839	ECY	$23.22	$367,784	$36,778	$5,462	$410,024	
10	Hauling (assume 24 mile route)	101,518	BCY	$8.66	$879,362	$87,936	$13,059	$980,356	
15	Finish Grading	79	AC	$1,123	$88,186	$8,819	$1,310	$98,314	
	Seed/Fertilizer/Mulch								
16	Seed - Pasture	79	AC	$2,197	$172,538	$17,254	$2,562	$192,354	
17	Remove/Repair Temporary Access/Haul Road	6.5	LS	$10,347	$67,047	$6,705	$996	$74,747	
	Temporary Erosion and Sediment Control - Post-Construction								
18	Silt Fence	6,843	LF	$1.42	$9,716	$972	$144	$10,832	
19	Inspection and Maintenance	6.5	LS	$2,619	$16,970	$1,697	$252	$18,919	
20	Construction Survey and Staking	13.0	DY	$1,104	$14,302	$1,430	$212	$15,944	
				Total:	**$13,905,223**	**$1,390,522**	**$206,493**	**$15,502,238**	

Overall Cost ($/BCY):	**$36.19**

Notes:

1. The contingency of 10% reflects the unknown costs associated with constructing a given project, such as adverse weather conditions, materials costs, or unfavorable market conditions.
2. The escalation of 1.35% reflects cost increases from the date of estimate preparation to assumed midpoint of construction
3. The Project Cost includes an escalation of 1.35% and a contingency of 10%.
4. Waste haul route length is from the approximate center of each segment to the Sunflower Pit waste consolidation area.
5. For estimating purposes the backfill/topsoil haul route length was assumed to be half the length of the waste haul route and that the Contractor will utilize multiple borrow sites
6. XRF spacing is assumed to be one pair every 50 linear feet of rail embankment.

TOTAL PROJECT COST TABLE

Cherokee County Superfund Site

Operable Unit 8 - Railroads

Cherokee County, Kansas

SEGMENT B

Item	Description	Estimated Quantity	Unit of Measure	Unit Cost	Contract Cost	Contingency[1] 10%	Escalation[2] 1.35%	Project Cost[3]	Notes
01 - Initial Activities					**$42,209**	**$4,221**	**$627**	**$47,057**	
01	Temporary Access/Haul Road Improvements	2.1	EA	$4,500	$9,313	$931	$138	$10,383	
02	XRF Grid Survey	874	EA	$37.63	$32,896	$3,290	$489	$36,674	
02 - Site Preparation					**$33,060**	**$3,306**	**$491**	**$36,857**	
03	Construction Survey and Staking	2.1	DY	$1,104	$2,284	$228	$34	$2,546	
	Temporary Erosion and Sediment Control - Pre-Construction								
04	Silt Fence	4,371	LF	$1.58	$6,906	$691	$103	$7,699	
05	Straw Bales	437	LF	$13.46	$5,882	$588	$87	$6,558	
06	Inspection and Maintenance	2.0	LS	$4,365	$8,730	$873	$130	$9,733	
07	Temporary Sedimentation Basin		LS	$22,747	$0	$0	$0	$0	
08	Clearing and Grubbing	6.3	AC	$1,476	$9,257	$926	$137	$10,320	
03 - Earthwork					**$5,930,778**	**$593,078**	**$88,072**	**$6,611,928**	
	Mining/Railroad Embankment Waste and Contaminated Soil								
09	Excavation and Loading	234,245	BCY	$7.22	$1,691,248	$169,125	$25,115	$1,885,488	
10	Hauling (assume 64 mile cycle)	234,245	BCY	$14.29	$3,346,891	$334,689	$49,701	$3,731,282	
11	Placement and Rough Grading at Sunflower Pit	234,245	BCY	$3.61	$845,624	$84,562	$12,558	$942,744	
12	Confirmation Sampling	874	EA	$53.78	$47,014	$4,701	$698	$52,414	
04 - Restoration					**$1,329,763**	**$132,976**	**$19,747**	**$1,482,487**	
	Import and Place Fill from Off-Site Borrow Sources								
	General Restoration								
13	Select Fill	46,849	ECY	$13.22	$619,344	$61,934	$9,197	$690,475	
14	Top Soil	5,059	ECY	$23.22	$117,471	$11,747	$1,744	$130,962	
10	Hauling (assume 32 mile route)	51,908	BCY	$9.56	$495,986	$49,599	$7,365	$552,950	
15	Finish Grading	18.8	AC	$1,123	$21,125	$2,112	$314	$23,551	
	Seed/Fertilizer/Mulch								
16	Seed - Pasture	18.8	AC	$2,197	$41,332	$4,133	$614	$46,079	
17	Remove/Repair Temporary Access/Haul Road	2.1	LS	$10,347	$21,415	$2,141	$318	$23,874	
	Temporary Erosion and Sediment Control - Post-Construction								
18	Silt Fence	2,186	LF	$1.42	$3,103	$310	$46	$3,460	
19	Inspection and Maintenance	2.1	LS	$2,619	$5,420	$542	$80	$6,043	
20	Construction Survey and Staking	4.1	DY	$1,104	$4,568	$457	$68	$5,093	
				Total:	**$7,335,811**	**$733,581**	**$108,937**	**$8,178,328**	

Overall Cost ($/BCY):	**$34.91**

Notes:

1. The contingency of 10% reflects the unknown costs associated with constructing a given project, such as adverse weather conditions, materials costs, or unfavorable market conditions.
2. The escalation of 1.35% reflects cost increases from the date of estimate preparation to assumed midpoint of construction
3. The Project Cost includes an escalation of 1.35% and a contingency of 10%.
4. Waste haul route length is from the approximate center of each segment to the Sunflower Pit waste consolidation area.
5. For estimating purposes the backfill/topsoil haul route length was assumed to be half the length of the waste haul route and that the Contractor will utilize multiple borrow sites

TOTAL PROJECT COST TABLE

Cherokee County Superfund Site

Operable Unit 8 - Railroads

Cherokee County, Kansas

SEGMENT C

Item	Description	Estimated Quantity	Unit of Measure	Unit Cost	Contract Cost	Contingency[1] 10%	Escalation[2] 1.35%	Project Cost[3]	Notes
01 - Initial Activities					**$24,769**	**$2,477**	**$368**	**$27,614**	
01	Temporary Access/Haul Road Improvements	1.2	EA	$4,500	$5,465	$547	$81	$6,093	
02	XRF Grid Survey	513	EA	$37.63	$19,304	$1,930	$287	$21,521	
02 - Site Preparation					**$18,650**	**$1,865**	**$277**	**$20,792**	
03	Construction Survey and Staking	1.2	DY	$1,104	$1,340	$134	$20	$1,494	
	Temporary Erosion and Sediment Control - Pre-Construction								
04	Silt Fence	2,565	LF	$1.58	$4,053	$405	$60	$4,518	
05	Straw Bales	257	LF	$13.46	$3,459	$346	$51	$3,857	
06	Inspection and Maintenance	1.0	LS	$4,365	$4,365	$437	$65	$4,867	
07	Temporary Sedimentation Basin		LS	$22,747	$0	$0	$0	$0	
08	Clearing and Grubbing	3.7	AC	$1,476	$5,432	$543	$81	$6,056	
03 - Earthwork					**$2,306,112**	**$230,611**	**$34,246**	**$2,570,968**	
	Mining/Railroad Embankment Waste and Contaminated Soil								
09	Excavation and Loading	90,713	BCY	$7.22	$654,946	$65,495	$9,726	$730,166	
10	Hauling (assume 54 mile cycle)	90,713	BCY	$14.29	$1,296,104	$129,610	$19,247	$1,444,961	
11	Placement and Rough Grading at Sunflower Pit	90,713	BCY	$3.61	$327,473	$32,747	$4,863	$365,083	
12	Confirmation Sampling	513	EA	$53.78	$27,589	$2,759	$410	$30,758	
04 - Restoration					**$548,547**	**$54,855**	**$8,146**	**$611,548**	
	Import and Place Fill from Off-Site Borrow Sources								
	General Restoration								
13	Select Fill	18,143	ECY	$13.22	$239,844	$23,984	$3,562	$267,391	
14	Top Soil	2,969	ECY	$23.22	$68,934	$6,893	$1,024	$76,851	
10	Hauling (assume 27 mile route)	21,111	BCY	$8.66	$182,868	$18,287	$2,716	$203,871	
15	Finish Grading	11.0	AC	$1,123	$12,397	$1,240	$184	$13,820	
	Seed/Fertilizer/Mulch								
16	Seed - Pasture	11.0	AC	$2,197	$24,254	$2,425	$360	$27,040	
17	Remove/Repair Temporary Access/Haul Road	1.2	LS	$10,347	$12,567	$1,257	$187	$14,010	
	Temporary Erosion and Sediment Control - Post-Construction								
18	Silt Fence	1,283	LF	$1.42	$1,821	$182	$27	$2,030	
19	Inspection and Maintenance	1.2	LS	$2,619	$3,181	$318	$47	$3,546	
20	Construction Survey and Staking	2.4	DY	$1,104	$2,681	$268	$40	$2,988	
				Total:	**$2,898,078**	**$289,808**	**$43,036**	**$3,230,922**	

Overall Cost ($/BCY):	**$35.62**

Notes:

1. The contingency of 10% reflects the unknown costs associated with constructing a given project, such as adverse weather conditions, materials costs, or unfavorable market conditions.
2. The escalation of 1.35% reflects cost increases from the date of estimate preparation to assumed midpoint of construction
3. The Project Cost includes an escalation of 1.35% and a contingency of 10%.
4. Waste haul route length is from the approximate center of each segment to the Sunflower Pit waste consolidation area.
5. For estimating purposes the backfill/topsoil haul route length was assumed to be half the length of the waste haul route and that the Contractor will utilize multiple borrow sites

TOTAL PROJECT COST TABLE

Cherokee County Superfund Site

Operable Unit 8 - Railroads

Cherokee County, Kansas

SEGMENT E

Item	Description	Estimated Quantity	Unit of Measure	Unit Cost	Contract Cost	Contingency[1] 10%	Escalation[2] 1.35%	Project Cost[3]	Notes
01 - Initial Activities					**$4,967**	**$497**	**$74**	**$5,537**	
01	Temporary Access/Haul Road Improvements	0.5	EA	$4,500	$2,250	$225	$33	$2,508	
02	XRF Grid Survey	72	EA	$37.63	$2,717	$272	$40	$3,029	
02 - Site Preparation					**$6,736**	**$674**	**$100**	**$7,510**	
03	Construction Survey and Staking	0.5	DY	$1,104	$552	$55	$8	$615	
	Temporary Erosion and Sediment Control - Pre-Construction								
04	Silt Fence	361	LF	$1.58	$570	$57	$8	$636	
05	Straw Bales	36	LF	$13.46	$485	$48	$7	$540	
06	Inspection and Maintenance	1.0	LS	$4,365	$4,365	$437	$65	$4,867	
07	Temporary Sedimentation Basin		LS	$22,747	$0	$0	$0	$0	
08	Clearing and Grubbing	0.5	AC	$1,476	$765	$76	$11	$852	
03 - Earthwork					**$380,276**	**$38,028**	**$5,647**	**$423,951**	
	Mining/Railroad Embankment Waste and Contaminated Soil								
09	Excavation and Loading	14,041	BCY	$7.22	$101,377	$10,138	$1,505	$113,021	
10	Hauling (assume 50 mile cycle)	14,041	BCY	$14.29	$200,621	$20,062	$2,979	$223,662	
11	Placement and Rough Grading at Sunflower Pit	14,041	BCY	$3.61	$50,689	$5,069	$753	$56,510	
12	Confirmation Sampling	513	EA	$53.78	$27,589	$2,759	$410	$30,758	
04 - Restoration					**$87,773**	**$8,777**	**$1,303**	**$97,853**	
	Import and Place Fill from Off-Site Borrow Sources								
	General Restoration								
13	Select Fill	2,808	ECY	$13.22	$37,125	$3,712	$551	$41,389	
14	Top Soil	418	ECY	$23.22	$9,702	$970	$144	$10,816	
10	Hauling (assume 25 mile route)	3,226	BCY	$8.66	$27,944	$2,794	$415	$31,154	
15	Finish Grading	1.6	AC	$1,123	$1,745	$174	$26	$1,945	
	Seed/Fertilizer/Mulch								
16	Seed - Pasture	1.6	AC	$2,197	$3,414	$341	$51	$3,806	
17	Remove/Repair Temporary Access/Haul Road	0.5	LS	$10,347	$5,174	$517	$77	$5,768	
	Temporary Erosion and Sediment Control - Post-Construction								
18	Silt Fence	181	LF	$1.42	$256	$26	$4	$286	
19	Inspection and Maintenance	0.5	LS	$2,619	$1,310	$131	$19	$1,460	
20	Construction Survey and Staking	1.0	DY	$1,104	$1,104	$110	$16	$1,230	
				Total:	**$479,752**	**$47,975**	**$7,124**	**$534,852**	

Overall Cost ($/BCY):	**$38.09**

Notes:

1. The contingency of 10% reflects the unknown costs associated with constructing a given project, such as adverse weather conditions, materials costs, or unfavorable market conditions.
2. The escalation of 1.35% reflects cost increases from the date of estimate preparation to assumed midpoint of construction
3. The Project Cost includes an escalation of 1.35% and a contingency of 10%.
4. Waste haul route length is from the approximate center of each segment to the Sunflower Pit waste consolidation area.
5. For estimating purposes the backfill/topsoil haul route length was assumed to be half the length of the waste haul route and that the Contractor will utilize multiple borrow sites

TOTAL PROJECT COST TABLE

Cherokee County Superfund Site

Operable Unit 8 - Railroads

Cherokee County, Kansas

SEGMENT H1

Item	Description	Estimated Quantity	Unit of Measure	Unit Cost	Contract Cost	Contingency[1] 10%	Escalation[2] 1.35%	Project Cost[3]	Notes
01 - Initial Activities					**$13,712**	**$1,371**	**$204**	**$15,287**	
01	Temporary Access/Haul Road Improvements	1.0	EA	$4,500	$4,500	$450	$67	$5,017	
02	XRF Grid Survey	245	EA	$37.63	$9,212	$921	$137	$10,270	
02 - Site Preparation					**$11,637**	**$1,164**	**$173**	**$12,974**	
03	Construction Survey and Staking	1.0	DY	$1,104	$1,104	$110	$16	$1,230	
	Temporary Erosion and Sediment Control - Pre-Construction								
04	Silt Fence	1,224	LF	$1.58	$1,934	$193	$29	$2,156	
05	Straw Bales	122	LF	$13.46	$1,642	$164	$24	$1,831	
06	Inspection and Maintenance	1.0	LS	$4,365	$4,365	$437	$65	$4,867	
07	Temporary Sedimentation Basin		LS	$22,747	$0	$0	$0	$0	
08	Clearing and Grubbing	1.8	AC	$1,476	$2,592	$259	$38	$2,890	
03 - Earthwork					**$315,225**	**$31,523**	**$4,681**	**$351,429**	
	Mining/Railroad Embankment Waste and Contaminated Soil								
09	Excavation and Loading	19,027	BCY	$7.22	$137,374	$13,737	$2,040	$153,151	
10	Hauling (assume 6 mile cycle)	19,027	BCY	$5.05	$95,999	$9,600	$1,426	$107,025	
11	Placement and Rough Grading at Sunflower Pit	19,027	BCY	$3.61	$68,687	$6,869	$1,020	$76,576	
12	Confirmation Sampling	245	EA	$53.78	$13,165	$1,317	$196	$14,677	
04 - Restoration					**$143,082**	**$14,308**	**$2,125**	**$159,515**	
	Import and Place Fill from Off-Site Borrow Sources								
	General Restoration								
13	Select Fill	3,805	ECY	$13.22	$50,307	$5,031	$747	$56,085	
14	Top Soil	1,417	ECY	$23.22	$32,895	$3,290	$488	$36,673	
10	Hauling (assume 6 mile route)	5,222	BCY	$5.05	$26,348	$2,635	$391	$29,374	
15	Finish Grading	5.3	AC	$1,123	$5,916	$592	$88	$6,595	
	Seed/Fertilizer/Mulch								
16	Seed - Pasture	5.3	AC	$2,197	$11,574	$1,157	$172	$12,903	
17	Remove/Repair Temporary Access/Haul Road	1.0	LS	$10,347	$10,347	$1,035	$154	$11,536	
	Temporary Erosion and Sediment Control - Post-Construction								
18	Silt Fence	612	LF	$1.42	$869	$87	$13	$969	
19	Inspection and Maintenance	1.0	LS	$2,619	$2,619	$262	$39	$2,920	
20	Construction Survey and Staking	2.0	DY	$1,104	$2,207	$221	$33	$2,461	
				Total:	**$483,656**	**$48,366**	**$7,182**	**$539,204**	

Overall Cost ($/BCY):	**$28.34**

Notes:

1. The contingency of 10% reflects the unknown costs associated with constructing a given project, such as adverse weather conditions, materials costs, or unfavorable market conditions.
2. The escalation of 1.35% reflects cost increases from the date of estimate preparation to assumed midpoint of construction
3. The Project Cost includes an escalation of 1.35% and a contingency of 10%.
4. Waste haul route length is from the approximate center of each segment to the Sunflower Pit waste consolidation area.
5. For estimating purposes the backfill/topsoil haul route length was assumed to be half the length of the waste haul route and that the Contractor will utilize multiple borrow sites

TOTAL PROJECT COST TABLE

Cherokee County Superfund Site

Operable Unit 8 - Railroads

Cherokee County, Kansas

SEGMENT H2

Item	Description	Estimated Quantity	Unit of Measure	Unit Cost	Contract Cost	Contingency[1] 10%	Escalation[2] 1.35%	Project Cost[3]	Notes
01 - Initial Activities					**$8,399**	**$840**	**$125**	**$9,363**	
01	Temporary Access/Haul Road Improvements	0.5	EA	$4,500	$2,250	$225	$33	$2,508	
02	XRF Grid Survey	163	EA	$37.63	$6,149	$615	$91	$6,855	
02 - Site Preparation					**$9,042**	**$904**	**$134**	**$10,080**	
03	Construction Survey and Staking	0.5	DY	$1,104	$552	$55	$8	$615	
	Temporary Erosion and Sediment Control - Pre-Construction								
04	Silt Fence	817	LF	$1.58	$1,291	$129	$19	$1,439	
05	Straw Bales	82	LF	$13.46	$1,104	$110	$16	$1,230	
06	Inspection and Maintenance	1.0	LS	$4,365	$4,365	$437	$65	$4,867	
07	Temporary Sedimentation Basin		LS	$22,747	$0	$0	$0	$0	
08	Clearing and Grubbing	1.2	AC	$1,476	$1,730	$173	$26	$1,929	
03 - Earthwork					**$109,564**	**$10,956**	**$1,627**	**$122,147**	
	Mining/Railroad Embankment Waste and Contaminated Soil								
09	Excavation and Loading	6,348	BCY	$7.22	$45,832	$4,583	$681	$51,096	
10	Hauling (assume 8 mile route)	6,348	BCY	$5.05	$32,028	$3,203	$476	$35,707	
11	Placement and Rough Grading at Sunflower Pit	6,348	BCY	$3.61	$22,916	$2,292	$340	$25,548	
12	Confirmation Sampling	163	EA	$53.78	$8,788	$879	$130	$9,797	
04 - Restoration					**$69,758**	**$6,976**	**$1,036**	**$77,770**	
	Import and Place Fill from Off-Site Borrow Sources								
	General Restoration								
13	Select Fill	1,270	ECY	$13.22	$16,784	$1,678	$249	$18,712	
14	Top Soil	946	ECY	$23.22	$21,957	$2,196	$326	$24,479	
10	Hauling (assume 8 mile route)	2,215	BCY	$5.05	$11,177	$1,118	$166	$12,460	
15	Finish Grading	3.5	AC	$1,123	$3,949	$395	$59	$4,402	
	Seed/Fertilizer/Mulch								
16	Seed - Pasture	3.5	AC	$2,197	$7,725	$773	$115	$8,613	
17	Remove/Repair Temporary Access/Haul Road	0.5	LS	$10,347	$5,174	$517	$77	$5,768	
	Temporary Erosion and Sediment Control - Post-Construction								
18	Silt Fence	409	LF	$1.42	$580	$58	$9	$647	
19	Inspection and Maintenance	0.5	LS	$2,619	$1,310	$131	$19	$1,460	
20	Construction Survey and Staking	1.0	DY	$1,104	$1,104	$110	$16	$1,230	
				Total:	**$196,762**	**$19,676**	**$2,922**	**$219,361**	

Overall Cost ($/BCY):	**$34.56**

Notes:

1. The contingency of 10% reflects the unknown costs associated with constructing a given project, such as adverse weather conditions, materials costs, or unfavorable market conditions.
2. The escalation of 1.35% reflects cost increases from the date of estimate preparation to assumed midpoint of construction
3. The Project Cost includes an escalation of 1.35% and a contingency of 10%.
4. Waste haul route length is from the approximate center of each segment to the Sunflower Pit waste consolidation area.
5. For estimating purposes the backfill/topsoil haul route length was assumed to be half the length of the waste haul route and that the Contractor will utilize multiple borrow sites

TOTAL PROJECT COST TABLE

Cherokee County Superfund Site

Operable Unit 8 - Railroads

Cherokee County, Kansas

SEGMENT H4

Item	Description	Estimated Quantity	Unit of Measure	Unit Cost	Contract Cost	Contingency[1] 10%	Escalation[2] 1.35%	Project Cost[3]	Notes
01 - Initial Activities					**$4,824**	**$482**	**$72**	**$5,378**	
01	Temporary Access/Haul Road Improvements	0.5	EA	$4,500	$2,250	$225	$33	$2,508	
02	XRF Grid Survey	68	EA	$37.63	$2,574	$257	$38	$2,870	
02 - Site Preparation					**$6,639**	**$664**	**$99**	**$7,402**	
03	Construction Survey and Staking	0.5	DY	$1,104	$552	$55	$8	$615	
	Temporary Erosion and Sediment Control - Pre-Construction								
04	Silt Fence	342	LF	$1.58	$540	$54	$8	$602	
05	Straw Bales	34	LF	$13.46	$458	$46	$7	$510	
06	Inspection and Maintenance	1.0	LS	$4,365	$4,365	$437	$65	$4,867	
07	Temporary Sedimentation Basin		LS	$22,747	$0	$0	$0	$0	
08	Clearing and Grubbing	0.5	AC	$1,476	$724	$72	$11	$807	
03 - Earthwork					**$41,544**	**$4,154**	**$617**	**$46,316**	
	Mining/Railroad Embankment Waste and Contaminated Soil								
09	Excavation and Loading	2,385	BCY	$7.22	$17,221	$1,722	$256	$19,199	
10	Hauling (assume 3 mile route)	2,385	BCY	$5.05	$12,034	$1,203	$179	$13,416	
11	Placement and Rough Grading at Sunflower Pit	2,385	BCY	$3.61	$8,611	$861	$128	$9,599	
12	Confirmation Sampling	68	EA	$53.78	$3,679	$368	$55	$4,101	
04 - Restoration					**$39,405**	**$3,941**	**$585**	**$43,931**	
	Import and Place Fill from Off-Site Borrow Sources								
	General Restoration								
13	Select Fill	477	ECY	$13.22	$6,306	$631	$94	$7,031	
14	Top Soil	396	ECY	$23.22	$9,191	$919	$136	$10,247	
10	Hauling (assume 6 mile route)	873	BCY	$5.05	$4,404	$440	$65	$4,910	
15	Finish Grading	3.5	AC	$1,123	$3,949	$395	$59	$4,402	
	Seed/Fertilizer/Mulch								
16	Seed - Pasture	3.5	AC	$2,197	$7,725	$773	$115	$8,613	
17	Remove/Repair Temporary Access/Haul Road	0.5	LS	$10,347	$5,174	$517	$77	$5,768	
	Temporary Erosion and Sediment Control - Post-Construction								
18	Silt Fence	171	LF	$1.42	$243	$24	$4	$271	
19	Inspection and Maintenance	0.5	LS	$2,619	$1,310	$131	$19	$1,460	
20	Construction Survey and Staking	1.0	DY	$1,104	$1,104	$110	$16	$1,230	
				Total:	**$92,413**	**$9,241**	**$1,372**	**$103,027**	

Overall Cost ($/BCY):	**$43.19**

Notes:

1. The contingency of 10% reflects the unknown costs associated with constructing a given project, such as adverse weather conditions, materials costs, or unfavorable market conditions.
2. The escalation of 1.35% reflects cost increases from the date of estimate preparation to assumed midpoint of construction
3. The Project Cost includes an escalation of 1.35% and a contingency of 10%.
4. Waste haul route length is from the approximate center of each segment to the Sunflower Pit waste consolidation area.
5. For estimating purposes the backfill/topsoil haul route length was assumed to be half the length of the waste haul route and that the Contractor will utilize multiple borrow sites

TOTAL PROJECT COST TABLE

Cherokee County Superfund Site

Operable Unit 8 - Railroads

Cherokee County, Kansas

SEGMENT I

Item	Description	Estimated Quantity	Unit of Measure	Unit Cost	Contract Cost	Contingency[1] 10%	Escalation[2] 1.35%	Project Cost[3]	Notes
01 - Initial Activities					**$6,276**	**$628**	**$93**	**$6,997**	
01	Temporary Access/Haul Road Improvements	0.5	EA	$4,500	$2,250	$225	$33	$2,508	
02	XRF Grid Survey	107	EA	$37.63	$4,026	$403	$60	$4,489	
02 - Site Preparation					**$7,622**	**$762**	**$113**	**$8,498**	
03	Construction Survey and Staking	0.5	DY	$1,104	$552	$55	$8	$615	
	Temporary Erosion and Sediment Control - Pre-Construction								
04	Silt Fence	535	LF	$1.58	$845	$85	$13	$942	
05	Straw Bales	54	LF	$13.46	$727	$73	$11	$810	
06	Inspection and Maintenance	1.0	LS	$4,365	$4,365	$437	$65	$4,867	
07	Temporary Sedimentation Basin		LS	$22,747	$0	$0	$0	$0	
08	Clearing and Grubbing	0.8	AC	$1,476	$1,133	$113	$17	$1,263	
03 - Earthwork					**$281,425**	**$28,143**	**$4,179**	**$313,747**	
	Mining/Railroad Embankment Waste and Contaminated Soil								
09	Excavation and Loading	13,523	BCY	$7.22	$97,637	$9,764	$1,450	$108,851	
10	Hauling (assume 34 mile route)	13,523	BCY	$9.56	$129,215	$12,922	$1,919	$144,055	
11	Placement and Rough Grading at Sunflower Pit	13,523	BCY	$3.61	$48,819	$4,882	$725	$54,425	
12	Confirmation Sampling	107	EA	$53.78	$5,754	$575	$85	$6,415	
04 - Restoration					**$87,041**	**$8,704**	**$1,293**	**$97,038**	
	Import and Place Fill from Off-Site Borrow Sources								
	General Restoration								
13	Select Fill	2,705	ECY	$13.22	$35,755	$3,576	$531	$39,862	
14	Top Soil	619	ECY	$23.22	$14,378	$1,438	$214	$16,029	
10	Hauling (assume 17 mile route)	3,324	BCY	$6.41	$21,297	$2,130	$316	$23,743	
15	Finish Grading	2.3	AC	$1,123	$2,586	$259	$38	$2,883	
	Seed/Fertilizer/Mulch								
16	Seed - Pasture	2.3	AC	$2,197	$5,059	$506	$75	$5,640	
17	Remove/Repair Temporary Access/Haul Road	0.5	LS	$10,347	$5,174	$517	$77	$5,768	
	Temporary Erosion and Sediment Control - Post-Construction								
18	Silt Fence	268	LF	$1.42	$380	$38	$6	$423	
19	Inspection and Maintenance	0.5	LS	$2,619	$1,310	$131	$19	$1,460	
20	Construction Survey and Staking	1.0	DY	$1,104	$1,104	$110	$16	$1,230	
				Total:	**$382,365**	**$38,237**	**$5,678**	**$426,280**	

Overall Cost ($/BCY):	**$31.52**

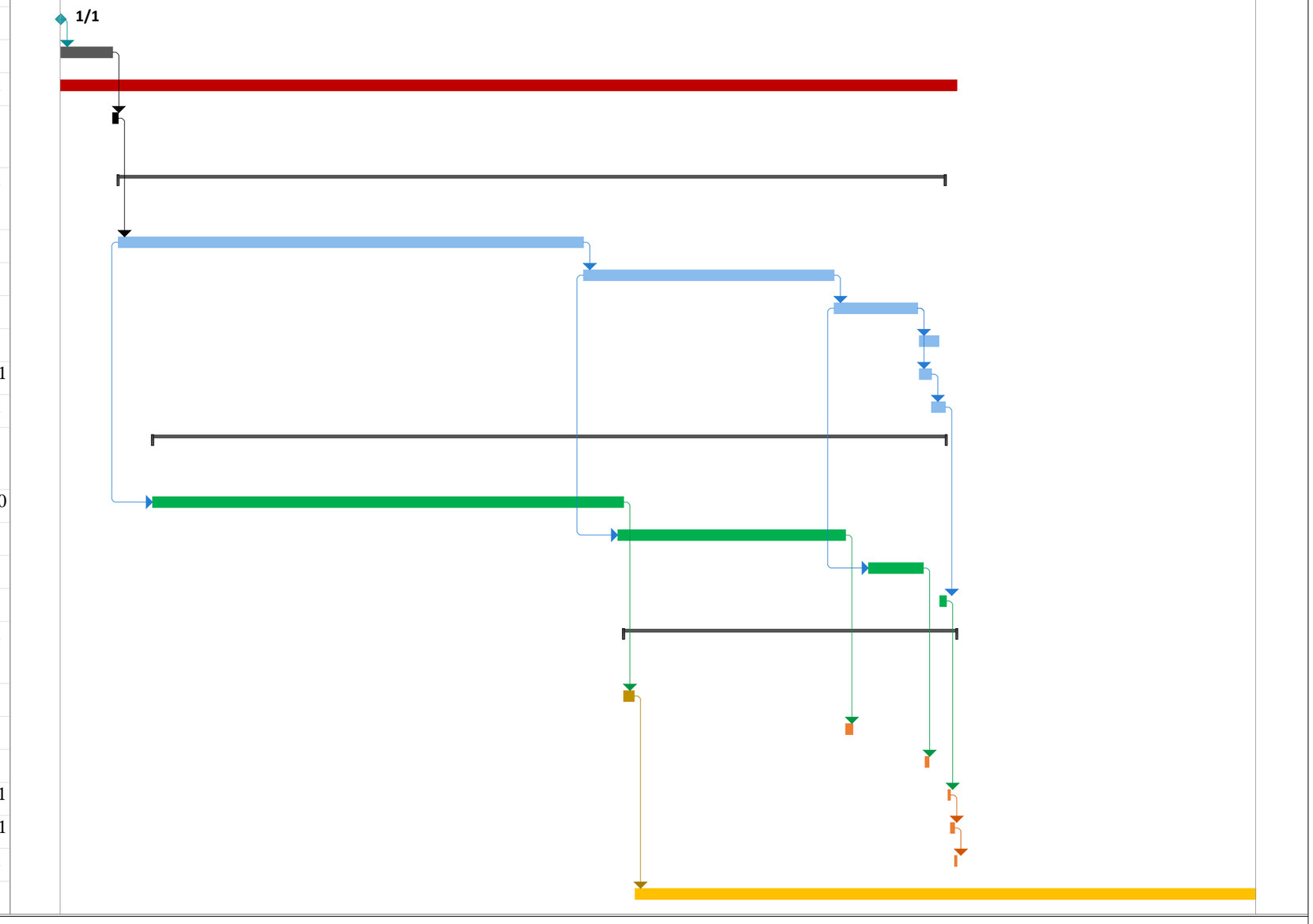
Notes:

1. The contingency of 10% reflects the unknown costs associated with constructing a given project, such as adverse weather conditions, materials costs, or unfavorable market conditions.
2. The escalation of 1.35% reflects cost increases from the date of estimate preparation to assumed midpoint of construction
3. The Project Cost includes an escalation of 1.35% and a contingency of 10%.
4. Waste haul route length is from the approximate center of each segment to the Sunflower Pit waste consolidation area.
5. For estimating purposes the backfill/topsoil haul route length was assumed to be half the length of the waste haul route and that the Contractor will utilize multiple borrow sites

ATTACHMENT 4
CONSTRUCTION SCHEDULE

OU8 Railroads RA Construction Schedule
Cherokee County Superfund Site

ID	Task Name	Duration	Start	Finish
1				
2	**Project Award**	1 day	Tue 1/1/19	Tue 1/1/19
3	**Prepare Plans and Permits**	45 days	Wed 1/2/19	Tue 3/5/19
4	**RA CONSTRUCTION**	783 days	Tue 1/1/19	Thu 12/30/21
5	**Primary Mobilization, Traffic Measures, Erosion Control**	5 days	Wed 3/6/19	Tue 3/12/19
6	**Excavation, Waste Transport, and Backfill/Topsoil Placement**	722 days	Wed 3/13/19	Thu 12/16/21
7	Segment A	406 days	Wed 3/13/19	Wed 9/30/20
8	Segment B	218 days	Thu 10/1/20	Mon 8/2/21
9	Segment C	74 days	Tue 8/3/21	Fri 11/12/21
10	Segment E	18 days	Mon 11/15/21	Wed 12/8/21
11	Segment H1/2/3/4	11 days	Mon 11/15/21	Mon 11/29/21
12	Segment I	13 days	Tue 11/30/21	Thu 12/16/21
13	**Restoration (Final Grading, Seeding & Mulching)**	693 days	Wed 4/24/19	Fri 12/17/21
14	Segment A	411 days	Wed 4/24/19	Wed 11/18/20
15	Segment B	198 days	Thu 11/12/20	Mon 8/16/21
16	Segment C	49 days	Tue 9/14/21	Fri 11/19/21
17	Segments E, H, I	6 days	Fri 12/10/21	Fri 12/17/21
18	**Closeout (Erosion Controls, Final Survey, and Demob)**	291 days	Thu 11/19/20	Thu 12/30/21
19	Segment A	9 days	Thu 11/19/20	Tue 12/1/20
20	Segment B	7 days	Tue 8/17/21	Wed 8/25/21
21	Segment C	5 days	Mon 11/22/21	Fri 11/26/21
22	Segment E	3 days	Mon 12/20/21	Wed 12/22/21
23	Segment H1/2/3/4	3 days	Thu 12/23/21	Mon 12/27/21
24	Segment I	3 days	Tue 12/28/21	Thu 12/30/21
25	**Project/Segments Warranty Per**	542 days	Thu 12/3/20	Fri 12/30/22



Project: OU8 RRs Const Schedule
Date: Mon 10/15/18

Task	Project Summary	Inactive Milestone	Manual Summary Rollup	Deadline
Split	External Tasks	Inactive Summary	Manual Summary	Progress
Milestone	External Milestone	Manual Task	Start-only	Manual Progress
Summary	Inactive Task	Duration-only	Finish-only	

ATTACHMENT 5
PROJECT SPECIFICATIONS

PRELIMINARY REMEDIAL DESIGN SPECIFICATIONS
CHEROKEE COUNTY SUPERFUND SITE
OPERABLE UNIT 8 – RAILROAD SITES
CHEROKEE COUNTY, KANSAS

Prepared for

U.S. Environmental Protection Agency Region 7
11201 Renner Boulevard
Lenexa, KS 66219

Architect and Engineering Services Contract EP-S7-05-05
Task Order 0073

October 2018

HydroGeoLogic, Inc
Exceeding Expectations

PRELIMINARY REMEDIAL DESIGN SPECIFICATIONS
CHEROKEE COUNTY SUPERFUND SITE
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October 2018

SPECIFICATIONS LIST

PERFORMANCE WORK STATEMENT

The Performance Work Statement is a stand-alone document and is not included with this submittal. It consists of contract language specifications. These specifications will be included in the bid package.

DIVISION 1 – GENERAL REQUIREMENTS

01010	Summary of Work	01720	Project Record Documents
01460	Spill Control	01721	Survey Requirements
01490	Environmental Protection	01770	Project Closeout

DIVISION 2 – SITE WORK

02111	Excavation and Handling of Mine and Mill Waste	02230	Clearing and Grubbing
02121	Transportation and Disposal of Waste Materials	02300	Excavation, Backfilling, and Compaction
02140	Cover Soil	02618	Storm Drainage
02141	Dewatering and Drainage	02910	Erosion and Sediment Control
02209	Riprap	02921	Seeding

DIVISION 3 – CONCRETE (NOT USED)

DIVISION 4 – MASONRY (NOT USED)

DIVISION 5 – METALS (NOT USED)

DIVISION 6 – WOOD AND PLASTICS (NOT USED)

DIVISION 7 – THERMAL AND MOISTURE PROTECTION (NOT USED)

DIVISION 8 – DOORS AND WINDOWS (NOT USED)

DIVISION 9 – FINISHES (NOT USED)

DIVISION 10 – SPECIALTIES (NOT USED)

DIVISION 11 – EQUIPMENT (NOT USED)

DIVISION 12 – FURNISHINGS (NOT USED)

DIVISION 13 – SPECIAL CONSTRUCTION (NOT USED)

DIVISION 14 – CONVEYING SYSTEM (NOT USED)

DIVISION 15 – MECHANICAL (NOT USED)

DIVISION 16 – ELECTRICAL (NOT USED)

SECTION 01010

SUMMARY OF WORK

PART 1 – GENERAL

1.1 DEFINITIONS

Chat - The coarse-grained portion of the mill waste residual material from the jigging and tabling milling process. Chat particle sizes typically range from 1/64 to 3/8-inch in diameter.

Chat Pile - Areas of stockpiled chat that may be actively quarried for material use as road subbase or concrete aggregate.

Contract - The Contract is the executed agreement between the Contractor and Government.

Contractor - The Contractor is the General Contractor and its subcontractors performing the work described herein and within the Specifications and the Contract Drawings for the U. S. Environmental Protection Agency (EPA) under this Contract.

Contracting Officer (CO) - The EPA Representative for contract administration.

Development Rock (Bull Rock) - non-mineralized, Pennsylvanian-age shales and limestone derived from shaft excavations.

Excavated Chat Pile - Chat piles in which all the usable chat has been removed.

Contracting Officer's Representative (COR) - The EPA Representative for field oversight.

Government - The Government, for purposes of the work herein, is the EPA Region 7.

Mill Waste - Fine-grained floatation tailings and coarse-grained chat that have concentrations of metals that are higher than surficial soils of the area.

Mine Waste - Materials generated from or impacted by historical mining operations.
Mine waste includes chat, tailings, waste rock and development rock.

Outwash Tailings - Mine tailings that have migrated outside the containment dikes and into streams and adjacent low-lying areas as a result of dike erosion or impoundment overflow.

Project Officer (PO) - The EPA Representative for project management and the technical aspects of the project.

Tailings - The fine-grained portion of mill waste which remain from the milling process. These tailings particles are silt size and smaller (finer than 200-mesh screen).

Tailings Impoundment - Diked surface impoundments designed to contain tailings from the froth flotation process. Tailings impoundments typically contain residual tailings and ponded water.

Waste Rock - the oversized material from opening the lateral drifts and tunnels.

1.2 SITE LOCATION AND DESCRIPTION

The Cherokee County Superfund Site (CERCLIS I.D. KSD980741862) spans 115 square miles in the southeastern portion of Kansas and is part of the larger 2,500-square-mile Tri-State Mining District of southeast Kansas, southwest Missouri, and northeast Oklahoma. The Cherokee County Superfund site is subdivided into the following operable units (OUs):

- OU1 - Galena Alternate Water Supply;
- OU2 - Spring River Basin;
- OU3 - Baxter Springs subsite;
- OU4 - Treece subsite;
- OU5 - Galena Groundwater/Surface Water;
- OU6 - Badger, Lawton, Waco, and Crestline subsites;
- OU7 - Galena Residential Soils;
- OU8 – Railroads; and
- OU9 – Tar Creek Watershed.

During the years the mines operated, railroads were constructed in Cherokee County to join conventional large-scale railroads to the individual mining operations. The ballast material used in the railroad beds was composed of chat from surrounding mine waste piles. Traditionally, these historical railroads were abandoned in place when mining operations ceased at each respective mine. Currently, the historical rail lines that cross through private property vary in condition: some show little deterioration from their original condition; others have degraded to the point they are unidentifiable as former rail lines. Depending on the current use of the area, some former rail lines exhibit extensive vegetative regrowth with a thick organic layer, while others have been incorporated into the surrounding area. Some historical rail lines have been investigated and remediated within other OUs. At some locations, some of the ballast may have been completely removed in areas along the rail lines as a result of construction activities, such as highway cuts. OU8 comprises the portions of the rail lines within the Cherokee County Superfund Site that have not been or will not be addressed in the remediation of other OUs and that have not been addressed by other means.

1.3 BASIS OF DESIGN

During the RI phase of this project, a human health risk assessment (HHRA) and a streamlined ecological risk assessment (ERA) was prepared for OU8 to determine whether contaminant exposure posed unacceptable risks to residents and wildlife. No significant human health risks were identified in the HHRA. The ERA results indicate that site-related contaminants in surface soil, surface water, and sediment may pose a threat to ecological receptors. However, sediment contamination does not appear to be attributable to the rail line.

Based on the results of the risk assessments, lead and zinc were identified as contaminants of concern (COCs) posing risk to ecological receptors. To address these risks, the remedial action objectives (RAO)s identified for CCR OU8 for protection of ecological receptors are:

- Prevent exposure of ecological receptors to COCs in source materials that would potentially result in unacceptable ecological risks.
- Prevent exposure of ecological receptors to COCs in soils that would potentially result in unacceptable ecological risks.

Ecological cleanup levels for soil were established as part of the ERA (EPA, 2015). Preliminary cleanup levels for site COCs in soil are presented in Table 1.

Table 1
Preliminary Cleanup Levels for Soil COCs

COCs	Cleanup Level Soil (mg/kg)
Lead	1,770
Zinc	4,000

mg/kg = milligrams per kilogram

1.4 WORK COVERED BY CONTRACT DOCUMENTS

The work specified by the Contract Documents (Performance Work Statement, Quality Assurance Surveillance Plan, Specifications and Contract Drawings) shall include, but is not limited to: excavating and transporting contaminated soil and mine waste to designated pits and waste consolidation areas, reshaping and covering mine waste, backfilling and compaction of fill and mine waste, and reclamation of excavated areas. Refer to the Performance Work Statement for additional information.

1.5 CODES AND STANDARDS

Codes and Standards that may apply to the project work include:

- American Association of State Highway and Transportation Officials (AASHTO) Standards
- American National Standards Institute (ANSI) Standards
- American Society for Testing and Materials (ASTM) Standards
- American Water Works Association (AWWA) Standards
- Code of Federal Regulations (CFR)
- U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) Standards
- Kansas Administrative Regulations (KAR)
- Kansas Department of Transportation (KDOT) Standards
- Kansas Department of Health and Environment (KDHE) Standards
- U.S. Environmental Protection Agency (EPA) Standards
- U.S. Department of Agriculture (USDA) Standards
- U.S. Department of Transportation (DOT)
- State of Kansas and Cherokee County Codes and Standards
- Kansas Department of Agriculture (KDA) Standards

1.6 LIST OF CONTRACT DRAWINGS

The Contract Drawings include the following:

Sheet No.	Drawing
G-01	Cover Sheet
G-02	General Notes and Legend
G-03a/b	General Site Plan

G-04	Layout of Sunflower Pit Waste Consolidation Area
C-Aa to Ar	Excavation and Restoration Plan – Segment A
C-Ba to Bf	Excavation and Restoration Plan – Segment B
C-Ca to Cg	Excavation and Restoration Plan – Segment C
C-Da to Dj	Excavation and Restoration Plan – Segment D
C-Ea to Ec	Excavation and Restoration Plan – Segment E
C-Fa	Excavation and Restoration Plan – Segment F
C-H1a to H4a	Excavation and Restoration Plan – Segment H
C-Ia to Id	Excavation and Restoration Plan – Segment I
CD-01	Civil Details 1
CD-02	Civil Details 2
CD-03	Civil Details 3

1.7 EXISTING CONDITIONS

1.7.1 The Contractor shall examine the site for the proposed work prior to submitting a bid, and ascertain that the location, size, and depth of surface structures, including roadway and permanent/ temporary structures, landscaping and utilities, as shown on the Contract Drawings and described herein, represent the actual conditions.

1.7.2 The Contractor shall immediately report any discrepancies between the details shown on the Contract Drawings and the actual field conditions or any omissions to the Contract Drawings and/or other documents to the COR and/or the PO.

1.8 SITE INSPECTION DURING BIDDING

1.8.1 The Contractor shall inspect the site and note all existing conditions and make note of the arrangements needed for access during construction, traffic control, maintenance of supplies, and interference with existing utilities.

1.8.2 The Contractor shall obtain clarification from the CO, the COR, and/or the PO when the meaning of the Contract Drawings and the Specifications are in doubt, prior to submitting the bid.

1.8.3 After submission of the bid, no claim will be considered on the grounds that there was any misunderstanding with respect to the conditions imposed by the Contract Documents.

1.8.4 Verbal conversation or agreement made at any time with an agency or employee of the Government or the CO, the COR, and/or the PO shall not affect or modify any of the terms or obligations under the Contract.

1.9 DIRECTION OF THE WORK

1.9.1 The CO, the COR, and/or the PO will not be responsible for the Contractor's means, methods, techniques, sequences or procedures of construction, or for the supervision of the Contractor's performance of this Contract, or for the failure to perform the Work in accordance with the Contract. However, if at any time the CO, the COR, and/or the PO is of the opinion that the number of workmen, pieces of equipment; or quality of machinery, tools, plant, and equipment or articles is inefficient or insufficient to meet the schedule; the CO, the COR, and/or the PO may so advise the Contractor. The Contractor shall promptly make the necessary changes to ensure that the schedule is adhered to.

1.9.2 Pursuant to the provisions of the General Conditions of the Contract, while it is intended that the Contractor shall be allowed in general to carry out the Contract in such a manner that may appear to be the most desirable, the CO, the COR, and/or the PO may direct the order in which the work shall be undertaken. This control shall be exercised in the interest of the Government and it is intended that an agreement be reached between all parties prior to the commencement of the Contract. Factors to be considered for the order in which work is performed include potential disruption of agricultural operations.

1.10 SECURITY

1.10.1 Neither the Government, nor the CO, the COR, or the PO will be responsible for any loss or damage to property of the Contractor. The Contractor shall furnish any additional security measures as deemed necessary for the duration of the project.

1.11 CONTRACTOR'S USE OF PREMISES

1.11.1 The Contractor shall limit on-site operations to necessary portions of the project boundaries.

1.11.2 Other areas are not to be used by the Contractor unless approved by the COR, and/or the PO.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 EXAMINATION OF THE SITE

The Contractor shall familiarize themselves with the area, surface, subsurface, and groundwater conditions at the site. No Contract adjustment will be made because of the failure of the Contractor to review and understand all existing site data.

3.2 HEALTH AND SAFETY PROTECTION

U.S. Department of Labor, Occupational Safety and Health Administration (OSHA) regulations (29 Code of Federal Regulations [CFR] 1910.120) specify worker health and safety protection requirements applicable to work at the site. Contractor shall conduct work in strict accordance with the Site Safety and Health Plan (SSHP) prepared by the Contractor to meet applicable OSHA regulations.

3.3 CONTRACTOR QUALITY ASSURANCE/QUALITY CONTROL

Quality workmanship and performance are essential in this project. Contractor shall also fully support and cooperate with all EPA Representatives in the implementation of the overall project quality control. The Contractor shall furnish documentation of materials supplied to the project, calibration of measuring equipment used, as-built items, and similar equipment items.

3.4 EXECUTION OF WORK

The Contractor shall complete all work in accordance with the Performance Work Statement, Quality Surveillance Plan, Contract Drawings and the Specifications.

END OF SECTION

SECTION 01460

SPILL CONTROL

PART 1 – GENERAL

1.1 SCOPE OF WORK

1.1.1 Develop, implement, maintain, supervise, and be responsible for comprehensive spill control procedures. This information shall be included in the Spill and Discharge Control Plan to be prepared by the Contractor. The plan shall provide contingency measures for potential release of contaminated soil and debris, contents of drums, stormwater run-off, and any other potentially contaminated and/or hazardous materials. In the event of a spill, the Contractor shall be required to follow the procedures established in the Spill and Discharge Control Plan.

1.1.2 Protect areas excavated during the work that are unimpacted. “Unimpacted” means uncontaminated media existent before the Work except for heavy metal contamination from mine waste within the work areas. If previously designated unimpacted areas are recontaminated due to the Contractor’s negligence, the Contractor shall restore those areas to unimpacted levels at no additional cost to the Government.

1.1.3 Provide equipment and personnel to perform emergency measures required to contain any spillages and to remove spilled materials and soils or liquids that become contaminated due to spillage. The collected spill material shall be properly disposed of at the Contractor’s expense. This includes spillage during fueling of equipment caused by Contractor operations.

1.2 SUBMITTALS

The Contractor shall submit the following in accordance with the Performance Work Statement.

1.2.1 Spill and Discharge Control Plan

The Spill and Discharge Control Plan shall be implemented in the event of an accidental release of potentially hazardous materials. The Spill and Discharge Control Plan shall contain the following elements:

a. Preventive Measures: The Contractor shall provide methods, means, and facilities required to prevent contamination of soil, water, atmosphere, uncontaminated structures, equipment, or material by the discharge of wastes from spills due to the Contractor's operations. Shovels, brooms, non-combustible absorbent materials, polyethylene sheeting, and personal protective equipment shall be maintained in accessible locations.

b. Emergency Measures: The Contractor shall provide equipment and personnel to perform emergency measures required to contain any spillage and to remove spilled materials, soils, or liquids that become contaminated due to spillage. This collected spill material shall be properly disposed of at the Contractor's expense.

c. Decontamination Measures: The Contractor shall provide the equipment and personnel to perform decontamination measures that may be required to remove spillage from previously uncontaminated structures, equipment, or material. Confirmation sampling following

remediation will be required of the Contractor. Two samples from the affected area shall be collected and analyzed for the spilled contaminants of concern. The results shall be compared to a third background sample collected from an unaffected area of the spill. Disposal of decontamination residues and confirmation samples shall be performed at the Contractor's expense.

d. Notification Procedures: The Contractor shall notify the EPA Field Representative and Project Officer immediately after the release of potentially hazardous materials. Based on the average lead concentration in mine waste, a release of 500 pounds of mine waste is considered reportable in accordance with 40 CFR 302. Petroleum releases greater than 25 gallons shall also be reported. The Contractor shall notify the following agencies:

Kansas Department of Health and Environment (KDHE)
Forbes Field, Building 740
Topeka, Kansas 66620
785-296-1679 (24-hour)

Kansas Emergency Management (KEM)
785-296-8013 (24-hour), 800-275-0297

Cherokee County Emergency Management
PO Box 143
Columbus, Kansas 66725
620-429-1857, 620-429-3992 (County Sheriff)

Cherokee County Local Emergency Planning Committee
PO Box 331
Baxter Springs, Kansas 66713
620-856-3536

United States Environmental Protection Agency (EPA) - Region 7 Spill Line
913-281-0991 (24-hour), 913-551-7003 (non-emergency)

National Spill Response Center (NRC)
800-424-8802

The following information shall be reported, at a minimum, with each spill:

- The material spilled,
- When the spill occurred,
- The location of the spill,
- The quantity spilled,
- Any measures taken to remediate the spill, and
- The reporter’s name and contact information.

PART 2 – PRODUCTS

2.1 MATERIALS

2.1.1 Provide methods, means, and facilities required to prevent contamination of soil, water, air, structures, equipment, or material by spills from the Contractor's operations.

2.1.2 Provide for the control of any unexpected spills as required by the Contractor's Spill and Discharge Control Plan.

PART 3 – EXECUTION

3.1 SPILL CONTROL

3.1.1 If a spill occurs, the Contractor shall:

3.1.1.1. Notify the EPA Field Representative and Project Officer immediately. The Contractor shall also notify KDHE and EPA of the spill through the contact numbers in Paragraph 1.2.1.

3.1.1.2. Take immediate measures to control, contain, and remediate the spill within the work area boundaries such that levels of contamination are similar to the levels that were present before the spill.

3.2 NOTIFICATION OF SPILLS

3.2.1 If the spill or discharge is reportable, and/or human health or the environment are threatened, the Contractor shall immediately implement spill control measures as required by the Contractor's Environmental Protection Plan and the Contractor's Spill and Discharge Control Plan.

3.3 DECONTAMINATION PROCEDURES

3.3.1 Decontamination procedures may be required after cleanup to eliminate traces of the substance spilled or reduce it to an acceptable level subject to review by the Contracting Officer's Representative (COR) and/or the Project Officer (PO). The Contractor shall provide equipment and personnel to perform decontamination measures.

3.3.2. Personnel decontamination should be completed as soon as possible and in accordance with the Contractor's Environmental Protection Plan and the Contractor's Spill and Discharge Control Plan.

3.4 SPILL REPORT

3.4.1 Submit a notification form after each spill, which shall be outlined in the Spill and Discharge Control Plan discussed in Paragraph 1.2.1.

END OF SECTION

SECTION 01490

ENVIRONMENTAL PROTECTION

PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS

The Contractor shall perform the work in a manner that minimizes environmental pollution and damage as the result of construction operations. Environmental pollution and damage is the presence of chemical, physical, or biological elements or agents which adversely affect human health or welfare; unfavorably alter ecological balances of importance to human life; affect other species of importance to humankind; or degrade the utility of the environment for aesthetic, cultural and/or historical purposes. The control of environmental pollution and damage requires consideration of land, water, and air, and includes management of visual aesthetics, noise, solid waste, as well as other pollutants. The environmental resources within the project boundaries and those affected outside the limits of permanent work as defined on the Contract Drawings shall be protected during the entire duration of this Contract. The Contractor shall ensure with this section by subcontractors.

1.1.1 Submittals

The Contractor shall submit the following in accordance with the Performance Work Statement.

1.1.1.1 Environmental Protection Plan

The Environmental Protection Plan shall include, but shall not be limited to, the following:

- Erosion control (erosion control measures shall be consistent with SECTION 02910 – EROSION AND SEDIMENT CONTROL);
- Pertinent regulations (federal, state, and local);
- Protection of natural resources;
- Protection of historical, archaeological, and cultural resources;
- Control and disposal of solid and sanitary wastes;
- Control and disposal of petroleum products; and
- Methods of reducing noise and dust pollution during construction activities.

1.2 LAND RESOURCES

The Contractor shall confine all activities to areas defined by the Contract Drawings and Specifications. Prior to the beginning of any construction, the Contractor shall identify the land resources to be preserved within the work areas. Except in areas indicated on the Contract Drawings or specified to be cleared, the Contractor shall not remove, cut, deface, injure, or destroy land resources including crops, trees, shrubs, vines, grasses, topsoil, and landforms without permission. No ropes, cables, or guys shall be fastened to or attached to any trees for anchorage unless specifically authorized by the Contracting Officer's Representative (COR) and/or the Project Officer (PO). Where such emergency use is permitted, the Contractor shall provide effective protection for land and vegetation resources at all times as defined in the following subparagraphs of this Specification Section. Stone, earth, or other material displaced into uncleared areas shall be removed.

1.2.1 Work Area Limits

Prior to any construction, the Contractor shall mark the areas that need not be disturbed under this contract. Isolated areas within the general work area which are to be saved and protected shall also be marked or fenced. Monuments and markers shall be protected before construction operations commence. Where construction operations are to be conducted during darkness, the markers shall be visible. The Contractor's personnel shall be knowledgeable of the purpose for marking and/or protecting particular objects.

1.2.2 Landscape

Trees, shrubs, vines, grasses, land forms, and other landscape features indicated and defined on the drawings to be preserved shall be clearly identified by marking, fencing, or wrapping with boards, or any other approved techniques.

1.2.3 Unprotected Erodible Soils

Earthwork brought to final grade shall be finished as indicated on the Contract Drawings. Side slopes and back slopes shall be protected as soon as practicable upon completion of rough grading. All earthwork shall be planned and conducted to minimize the duration of exposure of unprotected soils. Except in cases where the constructed feature obscures borrow areas, quarries, and mine waste areas, these areas shall not initially be totally cleared. Clearing of such areas shall progress in reasonably sized increments as needed to use the developed areas.

1.2.4 Disturbed Areas

The Contractor shall effectively prevent erosion and control sedimentation through approved methods as described in SECTION 02910 – EROSION AND SEDIMENT CONTROL.

1.2.5 Contractor Facilities and Work Areas

The Contractor's field offices, staging areas, stockpile storage, and temporary buildings shall be placed within the work areas shown on the Contract Drawings unless otherwise approved by the COR and/or the PO. Borrow areas shall be managed to minimize erosion and to prevent sediment from entering nearby waters. Spoil areas shall be managed and controlled to limit spoil intrusion into undisturbed areas and to prevent erosion of soil or sediment from entering nearby waters.

1.3 WATER RESOURCES

The Contractor shall keep construction activities under surveillance, management, and control to avoid pollution of surface and ground waters. Surveillance of water areas affected by construction shall be the Contractor's responsibility. All water areas affected by construction activities shall be monitored by the Contractor.

1.3.1 Water

Contaminated water generated from construction activities shall be evaporated or used as dust suppression water in contaminated areas unless otherwise allowed by the Contract Drawings or Specifications.

1.3.2 Stream Crossings

Stream crossings shall allow movement of materials or equipment without violating water pollution control standards of the Federal, State or local government.

1.3.3 Fish and Wildlife

The Contractor shall minimize interference with, disturbance to, and damage of fish and wildlife. Threatened and endangered species identified within the project work areas by the Kansas Department of Wildlife, Parks, and Tourism (KDWPT) shall be protected throughout the construction duration.

Livestock on private property shall be protected by maintaining existing gates and fences, or by making arrangements with specific property owners prior to construction in that area. Water shall be provided to livestock in areas where construction activities interfere with the access to existing water sources.

1.4 AIR RESOURCES

Equipment operation and activities or processes performed by the Contractor in accomplishing the specified construction shall be in accordance with applicable emission and performance laws and standards. Ambient Air Quality Standards set by the U.S. Environmental Protection Agency shall be maintained. Monitoring of air quality shall be the Contractor's responsibility. All air areas affected by the construction activities shall be monitored by the Contractor as described in the Site Safety and Health Plan (SSHP).

1.4.1 Dust Control

Dust particles, aerosols and gaseous by-products from construction activities and processing and preparation of materials, such as from chat and tailings impoundment grading, shall be controlled at all times, including weekends, holidays, and hours when work is not in progress. The Contractor shall maintain excavations, stockpiles, haul routes, permanent and temporary access roads, spoil areas, borrow areas, and other work areas within or outside the project boundaries free from particulates which would cause the ambient air quality standards to be exceeded or which would cause a hazard or a nuisance. Water spray, to be efficient, must be repeated to keep the disturbed area damp at all times. The Contractor must have sufficient, suitable equipment available to accomplish these tasks. Particulate control shall be performed as the work proceeds and whenever a particulate nuisance or hazard occurs. Dust levels shall be monitored by the Contractor in accordance with the SSHP. At a minimum, air shall be monitored for fugitive dusts using appropriate dust monitoring equipment.

Dust control is required along haul routes to mitigate impacts from truck traffic along gravel roadways.

1.4.2 Noise Control

The Contractor shall keep construction activities under surveillance and control to minimize environment damage by noise. The maximum allowable noise level is 90 decibels during the day (15 minute time weighted average).

All equipment used to transport waste materials along the haul routes shall be well maintained and equipped with muffler systems that effectively control engine noise.

1.5 WASTE DISPOSAL

1.5.1 Solid Wastes

Solid wastes shall be placed in containers which are emptied on a regular schedule. Handling and disposal shall be conducted to prevent contamination. Segregation measures shall be employed so that no hazardous or toxic waste will become co-mingled with solid waste. Solid waste shall be disposed in accordance with state and local laws and regulations. Containers shall be kept closed with a weather-tight lid when not loading or removing wastes.

1.5.2 Chemical Wastes

Chemicals, fuels, and oil shall be dispensed ensuring no spillage to ground or water. Periodic inspections of dispensing areas to identify leakage and initiate corrective action shall be performed and documented. Wastes shall be disposed of in accordance with Federal, state, and local laws and regulations.

1.5.3 Mining Wastes

The Contractor shall take sufficient measures to prevent spillage of mining wastes during construction activities. Mining wastes include, but are not limited to chat, bull rock, and tailings. Mine wastes shall be handled in accordance with these Specifications and Contract Drawings. Mine wastes shall not be transported or disposed offsite.

1.5.4 Burning

Burning of certain types of waste material will be permitted in accordance with SECTION 02230 – CLEARING AND GRUBBING.

1.6 HISTORICAL, ARCHEOLOGICAL, AND CULTURAL RESOURCES

No existing historical, archeological, and cultural resources within the project work areas have been identified. However, if historical, archeological, and/or cultural resources are discovered in the work areas, the Contractor shall take precautions to preserve all such resources as they existed at the time they were first identified. The Contractor shall provide and install protection for these resources and be responsible for their preservation during the life of the contract. If during excavation or other construction activities any previously unidentified or unanticipated resources are discovered or found, all activities that may damage or alter such resources shall be temporarily suspended. Resources covered by this Specification paragraph include but are not limited to: any human skeletal remains or burials; artifacts; shell, midden, bone, charcoal, or other deposits; rocks or coral alignments, pavings, wall, or other constructed features; and any indication of agricultural or other human activities. Upon such discovery or find, the Contractor shall immediately notify the EPA Representative. While waiting for instructions, the Contractor shall record, report, and preserve the finds in accordance with the National Historic Preservation Act and the National Archeological and Historic Preservation Act.

1.7 POST CONSTRUCTION CLEANUP

The Contractor shall clean up all areas used for construction.

1.8 RESTORATION OF LANDSCAPE DAMAGE

The Contractor shall restore landscape features damaged or destroyed during construction operations outside the limits of the approved work areas.

1.9 TRAINING OF CONTRACTOR PERSONNEL

The Contractor's personnel shall be trained in all phases of environmental protection, as required by the Performance Work Statement and contract documents. The training shall include methods of detecting and avoiding pollution, familiarization with pollution standards, both statutory and contractual, and installation and care of devices, vegetative covers, and instruments required for monitoring purposes to ensure adequate and continuous environmental pollution control.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01720

PROJECT RECORD DOCUMENTS

PART 1 – GENERAL

1.1 SCOPE OF WORK

1.1.1 In addition to the documents required in the Performance Work Statement, the Contractor shall maintain at the site one copy of each of the following documents.

1.1.1.1 Initial Construction schedule and periodic schedule updates

1.1.1.2 Contract Work Plans

1.1.1.3 Specifications

1.1.1.4 Contract Drawings

1.1.1.5 Addenda

1.1.1.6 Modifications to the Contract

1.1.1.7 Contracting Officer's, Contracting Officer's Representative (COR), and/or Project Officer's (PO) Directives

1.1.1.8 Written reports of any significant Quality Control problems

1.1.1.9 Submittals

1.1.1.10 Daily work activity summary reports, including:

a. Field tests records
b. Truck load ticket and shipping papers/manifests
c. Reports on any emergency response actions
d. Records of all site work
e. Meteorological records
f. All safety and accident incidents
g. Reports on all spill incidents
h. Construction quality control daily reports

1.1.2 These documents shall be made available to the Contracting Officer, COR, and/or the PO at all times upon request.

1.1.3 Where appropriate, one copy of all project record documents above shall be maintained on compact disc (CD) compatible with the Government's software.

1.2 MAINTENANCE OF DOCUMENTS

1.2.1 The Contractor shall store documents in the Contractor's administrative field office apart from documents used for work. In addition, the Contractor shall:

1.2.1.1 Provide for storage of documents

1.2.1.2 Provide locked cabinet or secure storage space

1.2.1.3 File documents and samples to facilitate retrieval

1.2.1.4 Maintain documents in a clean, dry legible condition and in good order and not use record documents for work purposes.

1.2.1.5 Legibly mark each section of the Specifications and addenda to record changes made by Work Directive Change or by Change Order.

1.3 SUBMITTALS

The Contractor shall submit the following in accordance with the Performance Work Statement.

1.3.1. Record Documents

- The Contractor shall submit record documents as specified in Paragraph 1.3.2 through Paragraph 1.3.4 of this Specification Section.

1.3.2 At the completion of field operations, the Contractor shall deliver record documents to the COR and/or the PO.

1.3.3 The Contractor shall transmit the submittals with a transmittal letter in duplicate, containing:

- Date,
- Project title and number,
- Contractor's name and address,
- Title and number of each record document, and
- Signature of Contractor or his authorized representative.

1.3.4 Documents must be submitted to the COR and/or the PO at completion of Contract.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 01721

SURVEY REQUIREMENTS

PART 1 – GENERAL

1.1 GENERAL REQUIREMENTS

1.1.1 The Contractor shall have a third party provide all materials, labor, and equipment required to conduct all survey work necessary for the project. The surveyor shall establish benchmarks as required to perform the work to the lines and grades indicated on the Contract Drawings. The benchmarks shall be tied into Kansas State Plane coordinate system.

1.1.2 The Contractor shall use only registered professional surveyors licensed in the state of Kansas for surveying activities. Copies of original surveyor field notes shall be provided to the Contracting Officer's Representative (COR) and/or the Project Officer (PO) as part of the project record documents. References shall be set and measurements taken using standard accepted surveying methods and equipment. All points shall be reported in the Kansas State Plane South Zone coordinate system in English feet. The horizontal position of all points shall be referenced to the North American Datum (NAD) 83, Zone 14 horizontal control datum. The vertical position of all points shall be referenced to the North American Vertical Datum (NAVD) 88 vertical control datum. The Contractor shall perform surveys for measurement and payment of completed work.

1.1.2.1 Initial Survey: As indicated on the design drawings, an aerial survey was completed in 2017 during the remedial design phase. The initial survey was based on aerial photography, ground control, and digital mapping using standard industry procedures which meet or exceed National Map Accuracy Standards (horizontal map scale of 1 inch = 50 feet and a vertical contour interval of 1 foot). CAD files of the design drawings showing existing site features and topography are available from EPA for use by the Contractor. There are no contract requirements for initial surveys to be performed by the Contractor.

1.1.2.2 Post-Excavation Surveys: The Contractor shall conduct a Post-Excavation Survey of each former rail line segment following removal of mine wastes/contaminated soil and confirmation sampling to document the volume of excavated materials. The accuracy of the surveys shall be consistent with the initial survey.

1.1.2.3 Survey of Waste Consolidation Areas: NOT USED

1.1.2.4 Final (As-Built or Record) Survey: When site remediation is completed, the Contractor shall conduct a final topographic survey of each former railroad segment to document as-built conditions and provide record documents. The survey shall document the following: 1) outline of the limits of construction and excavation areas; 2) locations of permanent drainage ditches, terraces (if any), and other surface water management features; and 3) locations and invert elevations of permanent drainage structures such as culverts and related structures. The permissible tolerances shall be one-tenth foot for spot elevations and half the contour interval for contours. The final survey shall be provided to EPA in hard copy (3 copies, 1 inch = 200 feet) and electronic AutoCAD (version 2013 or newer) formats.

1.2 SUBMITTALS

The Contractor shall submit the following in accordance with the Performance Work Statement.

1.2.1 Qualifications of Surveyor and their State of Kansas registration number.

1.2.2 Survey Elevation/Location Certifications.

- On request, documentation verifying accuracy of survey work shall be submitted to the COR and/or the PO.
- Certificates signed by the Surveyor stating that elevations and locations of Site construction features are in conformance, or nonconformance, with Contract Documents shall be submitted to the COR and/or the PO at the completion of each phase of work involving the Surveyor.

1.2.3 Surveying field notes, calculations, and graphical layouts.

1.2.4 Post-Excavation Surveys, Survey of Waste Consolidation Areas, and Final (As-built or Record) Survey in accordance with Paragraph GENERAL REQUIREMENTS herein.

PART 2 – PRODUCTS

2.1 SURVEY EQUIPMENT

The surveyor shall supply the appropriate surveying equipment required to perform the work to the lines and grades indicated on the Contract Drawings. All survey equipment shall be calibrated before use and maintained in accurate calibration throughout the execution of the work. Stakes, hubs, ribbons, nails, measuring devices and other materials shall be of good quality.

PART 3 – EXECUTION

3.1 SURVEY REQUIREMENTS

The surveyor shall use caution during the survey activities to minimize disturbance of land and resources. The surveyor shall make the measurements and define the locations required for the proper execution of the work detailed in these Specifications and Contract Drawings. Permanent benchmarks shall be installed by the surveyor for use as survey control.

3.2 FIELD RECORDS

3.2.1 Record original field notes, computations, and other data in field books and electronically.

3.2.2 Record survey data in accordance with recognized professional surveying standards.

3.3 PROPERTY PINS AND MARKERS

3.3.1 Locate and protect existing property pins and markers to the extent practicable during construction and reclamation activities.

3.3.2 Where property pins and markers are located within excavation areas, the area shall be clearly marked with flagging and marking paint. The Contractor shall hand-excavate in these areas being careful to not disturb the property pin.

3.3.3 A licensed surveyor meeting the requirements of Paragraph GENERAL REQUIREMENTS shall replace existing property pins or markers disturbed during site work.

END OF SECTION

SECTION 01770

PROJECT CLOSEOUT

PART 1 – GENERAL REQUIREMENTS

1.1 SCOPE OF WORK

This section covers the requirements for final site restoration, inspections, certificates, reports and determinations, and other procedures necessary for Contract closeout. Final site restoration shall be performed after meeting all the requirements outlined in the Contract Documents. Final restoration work shall consist of removing all equipment and performing cleanup of the site.

1.2 SUBMITTALS

The Contractor shall submit the following in accordance with the Performance Work Statement.

1.2.1 As-Built Surveys and Drawings

The Contractor shall record legibly in red ink, all approved changes or modifications to the Contract Drawings. The Contractor shall provide in format specified by the Contracting Officer's Representative (COR) and/or the Project Officer (PO), electronic copies of As-Built surveys of the disturbed areas as specified in SECTION 01721 – SURVEY REQUIREMENTS. The survey shall include final topography, locations and invert elevations of hydraulic controls, and the locations of permanent benchmarks. The Contractor shall be responsible for the development of the final As-Built Drawings.

1.3 PROJECT RECORD DOCUMENTS

1.3.1 As-Built Drawings

This paragraph covers as-built drawings to be completed, as a requirement of the Contract. The terms "drawings," "contract drawings," "drawing files," "working as-built drawings" and "final as-built drawings" refer to Contract Drawings which are revised to be used for final as-built drawings.

1.3.1.1 Working As-Built and Final As-Built Drawings

The Contractor shall revise one set of paper drawings by red-line process to show the as-built conditions during the execution of the project. These working as-built marked drawings shall be kept current on a weekly basis and shall be available on the jobsite at all times. Changes from the Contract Documents, which are made in the work or additional information which might be uncovered during construction, shall be accurately and neatly recorded as they occur by means of details and notes. The working as-built marked prints and final as-built drawings will be jointly reviewed for accuracy and completeness by the COR and/or the PO, and the Contractor. The working and final as-built drawings shall show, but shall not be limited to, the following information:

a. The actual location, kinds and sizes of all sub-surface utility lines.
b. Correct grade, elevations, cross section, or alignment of roads, earthwork, structures or utilities if any changes were made from Contract Documents.
c. Changes in details of design or additional information obtained from working drawings specified to be prepared and/or furnished by the Contractor.

d. The topography, invert elevations and grades of drainage installed or affected as part of the project construction.
e. Changes or modifications which result from the final inspection.
f. Where Contract Drawings or Specifications present options, only the option selected for construction shall be shown on the final as-built prints.

1.3.1.2 Computer Aided Design and Drafting (CADD) Drawings

Survey drawings shall be prepared using the latest version of AutoCAD or an approved earlier version. The Contractor is responsible for providing the electronic survey data to the COR and/or the PO. The Contractor will be responsible for preparing the As-Built Drawings.

1.4 FINAL CLEANING

All trailers, materials, equipment and debris shall be removed from the temporary storage areas. Temporary utilities shall be removed and restored to its pre-construction condition. The site shall have waste, surplus materials, and rubbish removed. The project area shall have temporary structures, barricades, project signs, and construction facilities removed.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION (NOT USED)

END OF SECTION

SECTION 02111

EXCAVATION AND HANDLING OF MINE AND MILL WASTE

PART 1 – GENERAL

1.1 SCOPE OF WORK

1.1.1 Furnish all labor, materials, equipment, and incidentals necessary to perform excavation in the locations shown on the Contract Drawings and handling of material.

1.1.2 Identify all utilities within the vicinity of work areas to be excavated and protect utilities prior to commencing excavation.

1.1.3 Identify property pins within the vicinity of the removal areas to be excavated and protect identified property pins in accordance with SECTION 01721 – SURVEY REQUIREMENTS prior to commencing excavation.

1.1.4 Install the appropriate erosion and sediment controls in accordance with SECTION 02910 – EROSION AND SEDIMENT CONTROL and as shown in the Contract Drawings prior to commencing excavation. Provide additional erosion and sediment controls during construction based on site conditions and actions.

1.1.5 Conduct clearing and grubbing in accordance with SECTION 02230 – CLEARING AND GRUBBING prior to commencing excavation.

1.1.6 The work shall consist of excavation or consolidation of mine waste, contaminated soil, and/or materials related to former railway embankments associated with former mining activities. The materials shall be placed within a mine waste consolidation area(s) or in subsidence pits as shown on the Contract Drawings.

1.1.9 Chemical analyses of tailings and chat have indicated elevated levels of lead, cadmium, zinc, and other heavy metals. The Contracting Officer's Representative (COR) and/or the Project Officer (PO) shall be notified within 48 hours if contaminated material is discovered which has not been previously identified.

1.2 REFERENCES

1.2.1 The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only. Where reference is made to one of the below standards, the revision in effect at the time of bid opening shall apply.

CODE OF FEDERAL REGULATIONS (CFR)

40 CFR 302	Designation, Reportable Quantities, and Notification

OTHER REGULATIONS

33 USC 2701	Oil Pollution Act

1.3 SUBMITTALS

The Contractor shall submit the following in accordance with the Performance Work Statement.

1.3.1 Mine Waste Material Tests

1.3.2 Excavation Work Plans

An Excavation Work Plan shall be submitted for the project work. The plan shall detail the proposed methods for excavating and transporting mine and mill waste, list of equipment, proposed phasing/ sequence of excavation and earthwork, proposed locations and source(s) of off-site borrow soil and topsoil, proposed locations of any temporary or permanent berms and/or drainage control structures, proposed methods of excavation to minimize contamination of the unimpacted soil beneath the interface between the mine waste materials and native soils, proposed sequencing or phasing of restoration activities to reestablish vegetative growth within completed excavation areas, and schedule for project completion. Schedules shall be consistent with schedules submitted within the plan in accordance with the Performance Work Statement.

1.4 DEFINITIONS

Contaminated soil – Native materials, predominantly silty clays, exhibiting elevated levels of heavy metals above the cleanup levels as a result of direct contact with or runoff from mine and mill waste.

1.5 SURVEYS

Surveys shall be conducted by the Contractor in accordance with Section 01721 – SURVEY REQUIREMENTS.

1.6 REGULATORY REQUIREMENTS

1.6.1 Permits and Licenses

The Contractor shall meet the substantive requirements of federal, state, and local permits for excavation and storage of material and all applicable construction activities.

1.7 SCHEDULING

The Contractor shall notify the COR and/or the PO 10 calendar days prior to the start of excavation of mine wastes and former railroad embankment materials.

PART 2 – PRODUCTS

2.1 SPILL RESPONSE MATERIALS

The Contractor shall provide spill response materials in accordance with SECTION 01460 – SPILL CONTROL. Spill and discharge response measures shall be described in the Spill and Discharge Control Plan. Spill response materials shall be available at all times in which hazardous materials/wastes are being handled or transported. Spill response materials shall be compatible with the type of materials used for this project.

PART 3 – EXECUTION

3.1 EXISTING STRUCTURES AND UTILITIES

The Contractor shall be responsible for verification that there are no utilities on the site. If utilities are present, the Contractor shall adequately mark and protect them from damage during the work. The Contractor shall pay for all damage, at no cost to the Government, to utilities caused by its negligence to adequately protect.

3.2 CLEARING AND GRUBBING

Clearing and grubbing shall be performed to the limits shown on the Contract Drawings in accordance with SECTION 02230 – CLEARING AND GRUBBING. Vegetation in the outwash areas may be excavated with the outwash tailings.

3.3 MINE AND MILL WASTE MATERIAL REMOVAL

3.3.1 Excavation

3.3.1.1 Areas of mine waste shall be excavated as shown in the Contract Drawings unless otherwise approved by the COR and/or the PO. Excavation shall be performed in a manner that will limit the potential for contaminated material to be mixed with uncontaminated material. Excavation shall include removal of the mine waste and underlying contaminated soil. The Contractor shall maintain an excavation of sufficient size to allow workers ample room to complete the work and collect confirmation samples from the excavation floor to verify unimpacted condition. The COR and/or the PO may conduct independent confirmation sampling of the excavation floor. The COR and/or the PO shall be notified at least 2 days before an area is completely excavated to allow time for him or her to be present to sample the excavation floor.

3.3.1.2 Storm water discharge shall be maintained during excavation and the impact of sedimentation on water quality shall be minimized. If completed excavations become recontaminated due to storm water runoff, removal and disposal of the contaminated materials shall be at the Contractor's expense.

3.4 CONFIRMATION SAMPLING AND ANALYSIS

3.4.1 Upon completion of the initial excavation, confirmatory sampling and inspection shall be performed by the Contractor using a confirmation sampling plan prepared by the Contractor and approved by the COR and/or the PO. The COR and/or the PO may also conduct confirmatory sampling. Confirmatory sampling by the COR and/or the PO does not relieve the Contractor of the responsibility for confirmatory sampling. Visual inspection methods may initially be used to verify removal of mine waste. Excavation of additional material shall occur if either the Contractor's or the COR/PO's confirmatory sampling indicates that the cleanup levels have not been met at the floor of the excavation.

3.5 MINE AND MILL WASTE MATERIAL STORAGE

Materials may be temporarily staged in stockpiles while allowing free water to drain. Stockpiles shall be constructed in locations that allow water to drain toward a sedimentation basin. Runoff from temporary stockpiles shall be protected by silt fence installed in accordance with SECTION 02910 –

EROSION AND SEDIMENT CONTROL to prevent sediment from migrating offsite. Stockpiles of mine waste materials in unimpacted areas shall not be permitted.

3.6 MINE WASTE DISPOSAL/CONSOLIDATION AREAS

3.6.1 Working Safely Near Collapse Features and Mine Shafts

3.6.1.1 The collapse features (subsidence pits) and mineshafts exhibit steep side slopes; these areas may be susceptible to additional mass movement and instability during remedial activities. Other work areas of the site may be underlain by subsurface voids which may collapse or open at any time. The Contractor shall be alert to these safety hazards and exercise extreme caution when working in and around the collapse features and mineshafts.

3.6.1.2 The sides of vertical openings may be extremely unstable. Extreme caution should be used when working around vertical openings. The Contractor is solely responsible for working safely at all areas of the site. The Contracting Officer, the COR, and/or the PO will stop work if the Contractor is not following general safety practices.

3.6.2 Filling Subsidence Pits

Not used

3.6.3 Mine Waste Placement

Mine waste shall be transported to and placed in designated mine waste disposal/consolidation areas as shown on the Contract Drawings. Transportation vehicles shall be required to follow designated traffic routes. Mine waste shall be placed in 12-inch (maximum) loose lifts and compacted by tracking or wheel rolling with heavy equipment to achieve a stable subgrade free of rutting or deformation under equipment traffic.

3.7 DRAINAGE AND DEWATERING

3.7.1 Drainage

The Contractor shall plan for and provide structures, equipment, and materials for the collection and disposal of surface and subsurface water encountered during the course of construction. Direct surface water away from excavation and construction sites to prevent erosion and undermining of foundations. Direct surface water away from residential and other building structures as well. Provide and maintain diversion ditches, berms and dikes, and grading as necessary during construction. Protect excavated slopes and backfill surfaces to prevent erosion and sloughing. Perform excavation so that the site, the area immediately surrounding the site, and the area affecting operations at the site shall be continually and effectively drained. Methods for drainage shall be consistent with the requirements of SECTION 02910 – EROSION AND SEDIMENT CONTROL.

3.7.2 Dewatering

3.7.2.1 Control groundwater flowing toward or into excavations to prevent sloughing or excavation slopes and walls, boils, uplift and heave in the excavation and to eliminate interference with orderly progress of construction. Implement control measures prior to reaching saturated materials within the

excavation to maintain the integrity of the in situ material. Conduct dewatering in accordance with SECTION 02141 – DEWATERING AND DRAINAGE.

3.7.2.2 Operate dewatering systems continuously until construction work below saturated materials is complete. Comply with all applicable Federal, state, and local laws and requirements for the discharge of water. The Contractor shall have a backup pump and system available for immediate use.

3.8 SPILL CLEANUP

In the event of a spill or release of a hazardous substance (as designated in 40 CFR 302), pollutant, contaminant, or oil (as governed by the Oil Pollution Act (OPA), 33 U.S.C. 2701 et seq.), the Contractor shall notify the COR and/or the PO immediately. If the spill exceeds the reporting threshold, the Contractor shall follow the pre-established procedures as described in the Spill and Discharge Control Plan and SECTION 01460 – SPILL CONTROL for immediate reporting and containment.

3.9 EQUIPMENT DECONTAMINATION

The Contractor shall decontaminate all equipment prior to departing contaminated work areas to ensure that no contaminated material leaves the work areas. Particular attention shall be given to mine waste transport vehicles. Contaminated materials generated during equipment decontamination such as mine waste residues and decontamination fluids shall be disposed of properly. Wash water shall be collected and discharged to a sedimentation basin. Debris tracked onto city or county roads shall be cleaned immediately. Excavation equipment shall be similarly decontaminated before leaving the contaminated areas.

3.10 EXCAVATION NEAR TREES AND PLANTS TO BE LEFT IN-PLACE

3.10.1 Trees and bushes to be left in-place during clearing and grubbing and excavation activities are shown in their approximate locations on the Contract Drawings. Each tree and bush type and size shall have a unique exclusion radius associated as specified in Table 02111-1.

TABLE 02111-1
EXCLUSION RADIUS SPECIFICATIONS

Tree and Plant Code	Plant Size and Type	Exclusion Radius (feet)
SC	Small Coniferous	2.5
MC	Medium Coniferous	5
LC	Large Coniferous	7.5
SD	Small Deciduous	2
MD	Medium Deciduous	4
LD	Large Deciduous	6
LB	Large Bush	2
MB	Medium Bush	2
SB	Small Bush	2

The Contractor shall follow the precautions specified in Paragraphs 3.10.2 through 3.10.4 herein when working within the exclusion radius of a tree or bush to be left in-place.

3.10.2 The Contractor shall not operate vehicles or perform mechanized excavation within the exclusion radius.

3.10.3 The Contractor shall excavate with hand tools only within the exclusion radius.

3.10.4 The Contractor shall take precautions to minimize damage to large root systems.

3.10.5 The Contractor shall take precautions to minimize damage to vegetation within bank protection areas. Contractor activities which contribute to destabilization of stream banks are strictly prohibited. These activities may include, but are not limited to, removal of vegetation within unauthorized work areas, disregard for protection of existing vegetation, and failure to complete excavation/restoration activities immediately adjacent to and within the bank protection areas as quickly as possible.

END OF SECTION

SECTION 02121

TRANSPORTATION AND DISPOSAL OF WASTE MATERIALS

PART 1 – GENERAL

1.1 SCOPE OF WORK

1.1.1 Furnish all labor, materials, equipment, and incidentals necessary to provide protection and maintenance of traffic, including traffic control, during construction activities.

1.1.2 Furnish all labor, materials, equipment, and incidentals necessary for transportation of materials, liquids, soils, and mine waste derived from construction activities at the sites.

1.1.3 Transport and dispose contaminated chat and mine waste in designated mine waste disposal/ consolidation areas.

1.1.4 Ensure that all operations for loading and hauling of all hazardous wastes are in compliance with the Federal and State Departments of Transportation regulations, EPA Hazardous Waste Regulation 40 CFR Parts 262 and 263, 49 CFR Parts 107, 172, 173, and 178, 29 CFR Parts 1910 and 1926, EPA OSWER Directive Number 9834.11, and all other applicable local, state, and federal requirements.

1.1.5 Dispose of nonhazardous wastes and noncontaminated waste materials in accordance with all applicable federal, state, and local regulations.

1.1.6 Acquire all necessary approvals and registrations, and keep appropriate records of all analysis and disposal records. The Contractor shall supply these records upon request to the Contracting Officer's Representative (COR) and/or the Project Officer (PO).

1.1.7 Transportation and disposal of all wastes shall also be in accordance with SECTION 02111 – EXCAVATION AND HANDLING OF MINE AND MILL WASTE and SECTION 02300 – EXCAVATION, BACKFILLING, AND COMPACTION.

1.1.8 Complete a pre- and post-video survey of haul routes in accordance with the Performance Work Statement. The Contractor shall be responsible for repair of any damages associated with use of public and/or private haul routes for transportation of mine wastes and borrow materials.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only. Where reference is made to one of the below standards, the revision in effect at the time of bid opening shall apply.

CODE OF FEDERAL REGULATIONS (CFR)

29 CFR 1910	Occupational Safety and Health Standards
29 CFR 1926	Safety and Health Regulations for Construction
40 CFR 261	Identification and Listing of Hazardous Waste

40 CFR 262	Standards Applicable to Generators of Hazardous Waste
40 CFR 263	Standards Applicable to Transporters of Hazardous Waste
40 CFR 264	Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 265	Interim Status Standards for Owners and Operators of Hazardous Waste Treatment, Storage, and Disposal Facilities
40 CFR 266	Standards for the Management of Specific Hazardous Wastes and Specific Types of Hazardous Waste Management Facilities
40 CFR 268	Land Disposal Restrictions
40 CFR 270	EPA Administered Permit Programs: The Hazardous Waste Management Program
40 CFR 279	Standards for the Management of Used Oil
40 CFR 300	National Oil and Hazardous Substances Pollution Contingency Plan
40 CFR 302	Designation, Reportable Quantities, and Notification
49 CFR 107	Hazardous Materials Program Procedures
49 CFR 172	Hazardous Materials Table, Special Provisions, Hazardous Materials Communications, Emergency Response Information, and Training Requirements
49 CFR 173	Shipper's: General Requirements for Shipments and Packagings
49 CFR 177	Carriage by Public Highway
49 CFR 178	Specifications for Packagings
49 CFR 397	Transportation of Hazardous Materials; Driving and Parking Rules

KANSAS ADMINISTRATIVE REGULATIONS (KAR)

KAR 28-19-647	Exceptions to Prohibition on Open Burning

MISCELLANEOUS

Manual on Uniform Traffic Control Devices (MUTCD)

U.S. Environmental Protection Agency (EPA) OSWER Directive Number 9834

Federal Resource Conservation and Recovery Act (RCRA), as amended

Department of Transportation Regulations applicable to transport methods

Posted weight and limitations on roads and bridges

1.3 SUBMITTALS

The Contractor shall submit the following items in accordance with the Performance Work Statement.

1.3.1 Traffic Control Plan

Submit a plan specific to the immediate surrounding area for haul routes. The plan shall address measures for the protection and diversion of traffic, including the provision of watchmen and flagmen, erection of barricades, and the erection and maintenance of adequate warning, danger, and direction

signs as required by the state and local authorities having jurisdiction. The plan shall be prepared in accordance with Paragraph 1.1 herein.

1.3.2 Test Reports

1.3.2.1 Spill Response

In the event of a spill or release of a hazardous substance (as designated in 40 CFR 302), pollutant or contaminant, oil (as governed by the Oil Pollution Act (OPA), 33 U.S.C. 2701 et seq.), the Contractor shall notify the COR and/or the PO immediately. If the spill exceeds a reporting threshold, the Contractor shall follow the pre-established procedures for immediate reporting and containment in accordance with SECTION 01460 – SPILL CONTROL.

1.3.2.2 Packaging Notifications

In accordance with 49 CFR 178.2(c), the Contractor shall acquire the appropriate notifications from the package manufacturers or any other persons certifying compliance with the packaging provisions and provide these to the Government.

1.3.3 Certificates

1.3.3.1 Certification

Copies of the current certificates of registration required by 49 CFR 107, Subpart G (Persons who Offer or Transport Hazardous Materials) issued to the Contractor and/or subcontractors or written statements certifying exemption from these requirements.

1.3.3.2 Training

Documentation that employees preparing or transporting hazardous materials have been trained, tested, and certified per 49 CFR 172, Subpart H, including general security awareness requirements.

1.3.4 Manifests and Exceptions Reports

Submit material shipment records/manifests as required by Paragraph 3.2 herein.

1.4 DEFINITIONS

1.4.1 Hazardous Material

A substance or material which has been determined by the Secretary of Transportation to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce, and which has been so designated pursuant to the Hazardous Materials Transportation Act (49 CFR 107, 172, 173, 177, 178, and 397) and Department of Transportation regulations applicable to transport method. The term includes materials designated as hazardous materials under the provisions of 49 CFR 172, Sections 101 and 102 and materials which meet the defining criteria for hazard classes and divisions in 49 CFR 173 Hazardous wastes are also hazardous materials as defined in Paragraph 1.4.2.

1.4.2 Hazardous Waste

A waste which meets criteria established in RCRA or specified by the EPA in 40 CFR 261 or which has been designated as hazardous by a RCRA authorized state program.

PART 2 – PRODUCTS

2.1 TRAFFIC PLANNING

Prepare the traffic control plan for use on low-volume roads in accordance with the criteria as specified in Part 5 of the MUTCD.

2.2 EQUIPMENT

2.2.1 Prevent spillage or leakage of contaminated soil and/or borrow material from trucks by using appropriate truck bed covers and other operational practices.

2.2.2 Provide suitable covers for all haul units. Cover all truck beds to prevent blowing and spilling of excavated material and/or borrow material.

2.3 SIGNS

2.3.1 Install all required signs per Table 5A-1 of the MUTCD.

2.3.2 Install retroreflective or illuminated signs that show the same shape and color by both day and night.

2.3.3 Install signs with retroreflective marking that is visible at night unless it is illuminated.

2.4 SIGN PLACEMENT

Place and position all signs and devices in accordance with the criteria contained in Part 5 of the MUTCD and as specified herein

2.5 WARNING SIGNS

Stop Ahead and Yield Signs – Install W3-1 and W3-2 stop ahead and yield ahead warning signs 300 feet before all construction activities and flagmen.

PART 3 – EXECUTION

3.1 GENERAL

Do not deliver waste to any facility other than the disposal facility listed on the material shipment record/manifest except as stated herein.

3.2 RECORDKEEPING – MATERIAL SHIPMENT RECORDS/MANIFESTS

3.2.1 Manifests will not be required for chat and mine waste and/or tailings to be placed in onsite subsidence pits and the mine waste disposal/consolidation areas.

3.2.2 Organize and maintain the material shipment records/manifests required by RCRA (Public Law 94 580) and the State of Kansas in accordance with 40 CFR Parts 262 and 263, as applicable for wastes other than chat, tailings, and mine waste. The Government will sign each manifest as the "Generator."

3.2.3 Obtain manifest forms, obtain material code numbers, and complete the shipment manifest records as required by the appropriate regulatory agencies for verifying the material type (Code No.) and quantity of each load in unit of volume and/or weight. Copies of each manifest shall be submitted to the COR and/or the PO within 2 business days following shipment and within 2 business days after notification of receipt at the disposal facility. Submitted copies of manifests shall include material quantities shipped and verification of receipt of the material by the receiving facility. Any manifest discrepancies shall be reported immediately to the COR and/or the PO and resolved by the Contractor. Prepare exception reports as required and submit these to the COR and/or the PO.

3.3 TRANSPORTATION

3.3.1 Only use the access and haul routes approved by the COR and/or the PO. Access along with protection and maintenance of traffic shall be as specified in Paragraphs 2.1 through 2.5 and 3.4.

3.3.2 The Contractor shall be held responsible for inspecting the access routes for road conditions, overhead clearance, and weight restrictions.

3.3.3 When using haul routes, the posted speed limit and weight and use limitations on roads and bridges shall be followed.

3.4 PROTECTION OF TRAFFIC

3.4.1 Maintain and protect traffic on all affected roads during the construction period, except as otherwise specifically approved by the COR and/or the PO. The traveling public shall be protected from damage to person and property. The Contractor's traffic on roads selected for hauling material to and from the work areas shall interfere as little as possible with public traffic.

3.4.2 Measures for the protection and diversion of traffic shall be in accordance with the approved Traffic Control Plan.

3.4.3 Measures for the protection and diversion of traffic, including the provision of watchmen and flagmen, and the erection and maintenance of adequate warning, danger, and direction signs, shall be as required by the state and local authorities having jurisdiction.

3.4.4 Develop, document, and implement a policy for accident prevention.

3.4.5 Implement and maintain detour routes throughout construction areas.

3.5 HAUL ROUTE MAINTENANCE

3.5.1 The Contractor shall periodically inspect all routes that the vehicles take from borrow areas to the site, and routes from the site to disposal areas for evidence of leakage or tracking of mud. Inspect paved haul routes daily for cleanliness and other damage from Contractor activities. The Contractor shall be responsible for any and all actions necessary to remedy situations involving material spilled in transit or mud and dust tracked off of the work areas. Contractor shall clean from

the surface any dirt or mud that is tracked onto paved or surfaced roadways. Any waste or contaminated materials that may build up along the Contractor's roadways or haul routes due to the Contractor's activities shall be cleaned up to background levels by the Contractor at the Contractor's expense.

3.5.2 The Contractor shall investigate the adequacy and condition of existing roads, the overhead clearance, and allowable load limit on these roads. Repair all incidental damage and settlement that occurs in existing roadways as a result of construction activities to the satisfaction of the County Engineer.

3.6 HAUL ROUTE IMPROVEMENTS

The Contractor shall make improvements to on-site haul roads, as necessary, to accommodate construction equipment. Temporary haul roads may be widened to permit two-way traffic as required. Chat shall not be used to improve haul roads unless approved by the COR and/or the PO.

3.7 HAUL ROUTES

3.7.1 Contractor is required to repair damage to haul routes determined to be caused by the Contractor as identified by the pre- and post-video survey taken of the haul routes in accordance with the Performance Work Statement.

3.8 SPILL RESPONSE

The Contractor shall respond to any spills of hazardous material or hazardous waste which are in the custody or care of the Contractor, pursuant to this contract. Any direction from the COR and/or the PO concerning a spill or release shall not be considered a change under the contract. The Contractor shall comply with all applicable requirements of Federal, state, or local laws or regulations regarding any spill incident. Spill control shall proceed in accordance with SECTION 01460 – SPILL CONTROL.

3.9 DISPOSAL OF MATERIALS

3.9.1 Trash and/or debris which must be removed from the sites shall be disposed in an appropriate manner following the applicable local, state, and federal regulations.

3.9.2 Household trash as defined by KDHE regulations shall be taken to a landfill approved to accept such materials. Construction and demolition (C&D) debris as defined by KDHE regulations shall be taken to a disposal site approved to accept C&D materials.

3.9.3 Appliances

3.9.3.1 Appliances (white goods), except for appliances containing Freon shall be crushed prior to loading for disposal

3.9.3.2 Appliances suspected of containing Freon shall be checked at the site prior to disposal. All items for which there is any question concerning the amount of Freon they may contain shall be taken to an approved Freon recycling disposal point. If the appliance is missing refrigeration equipment or otherwise definitely found not be containing Freon, it may be disposed as "white goods" with other household trash.

3.9.4 Tires shall be separated from the other trash and debris and taken to an approved disposal or recycling point.

3.9.5 Hazardous Materials

If any hazardous materials are encountered during performance of the work, the Contractor shall immediately notify the COR and/or the PO. The COR and/or the PO will investigate the nature of the materials and instruct the Contractor regarding proper management and disposal of the material. Management and disposal of the material shall be performed by the Contractor as directed by the COR and/or the PO, with no additional impacts to the schedule for ongoing work. Hazardous materials, non-mine waste contaminated soil, and non-mine waste shall be profiled, characterized, and properly managed and disposed of in accordance applicable local, state, and federal requirements.

3.9.6 Vegetative Material

3.9.6.1 Vegetative material removed from clearing and grubbing operations are not anticipated to be hazardous and shall be treated as noncontaminated, nonhazardous debris. The Contractor shall be responsible for the disposal of the clearing and grubbing debris. Dispose of all felled timber, logs, stumps, roots, brush, rotten wood, and other refuse from the clearing and grubbing operations in accordance with any applicable federal, state, and local guidelines.

3.9.6.2 Timber may be segregated for the property owner as approved by the COR and/or the PO.

3.9.6.3 Large clumps of soil and/or mine waste shall be brushed away from or otherwise mechanically removed from vegetation prior to disposal. Hydraulic removal methods shall not be used. Place clumps of soil and/or mine waste removed from vegetation during clearing and grubbing activities within the initial excavation limits of excavation as shown on the Contract Drawings.

3.9.6.4 If vegetative material is burned, open burning shall be conducted pursuant to KAR 28-19-647.

END OF SECTION

SECTION 02140

COVER SOIL

PART 1 – GENERAL

1.1 SCOPE OF WORK

1.1.1 Project-specific soil backfill (select fill) and topsoil shall be placed in areas where mine waste or related materials have been excavated to a depth below the nearby surrounding grade or where the material removal will adversely affect local drainage patterns. Unless otherwise specified, the cover profile shall consist of 6 inches (minimum) of select fill and 6 inches (minimum) of topsoil, as needed to match the excavated area to adjacent ground elevation or create positive drainage in the remediated areas. Based on the availability of suitable topsoil in the area, the 6-inch topsoil layer may be replaced with select fill sources amended with organic materials as required herein to support vegetative growth.

1.1.2 Select fill shall be used to construct earth berms and embankments as required by the Contract Drawings.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only. Where reference is made to one of the below standards, the revision in effect at the time of bid opening shall apply.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 422	Standard Test Method for Particle-Size Analysis of Soils
ASTM D 698	Standard Test Methods for Laboratory Compaction Characteristics of Soil Using Standard Effort [12,400 ft-lbf/ft^3 (600 kN-m/ m^3)]
ASTM D 2216	Standard Test Method for Laboratory Determination of Water (Moisture) Content of Soil and Rock by Mass
ASTM D 2487	Standard Classification of Soils for Engineering Purposes (Unified Soil Classification System)
ASTM D 2922	Standard Test Methods for Density of Soil and Soil-Aggregate in Place by Nuclear Methods (Shallow Depth)
ASTM D 2974	Standard Test Methods for Moisture, Ash, and Organic Matter of Peat and Other Organic Soils
ASTM D 3017	Standard Test Method for Water Content of Soil and Rock in Place by Nuclear Methods (Shallow Depth)
ASTM D 4318	Standard Test Methods for Liquid Limit, Plastic Limit, and Plasticity Index of Soils
ASTM D 4972	Standard Test Method for pH of Soils

MISCELLANEOUS DOCUMENTS

Dames & Moore, 1993. *Remedial Investigation for Cherokee County, Kansas CERCLA Site Baxter Springs/Treece Subsites*: Report Prepared for EPA Region 7.

Dames & Moore, 1993. *Feasibility Study Report for the Baxter Springs and Treece Subsites of the Cherokee County Superfund Site*: Report Prepared for EPA Region 7.

EPA Region 7, 1997. *Record of Decision for Cherokee County Superfund Site; Baxter Springs and Treece Subsites; OU-03, OU-4; Cherokee County, Kansas*.

EPA Region 7, 2006. *Record of Decision Amendment for Cherokee County Superfund Site; Baxter Springs and Treece Subsites; OU-3, OU-4; Cherokee County, Kansas*.

1.3 SUBMITTALS

The Contractor shall submit the following in accordance with the Performance Work Statement. At the pre-construction conference, the Contractor's submittal schedule will be developed with EPA. Submittals will be delivered to EPA according to this submittal schedule. Information on all topsoil and select fill materials and material sources shall be submitted to the COR for approval prior to commencement of the work.

1.3.1 Test Reports

- Borrow Source Testing
- Select Fill and Topsoil Material Tests
- Moisture Content and Density Tests of In-Place Select Fill

1.3.2 Surveys

- Soil Cover Thickness Drawing

1.3.3 Borrow Area Excavation and Restoration Plan

- Site plan showing location of borrow area(s) and traffic route(s) to and from the borrow area.
- Excavation plan showing approximate limits and depth of excavation.
- Restoration plan showing final contours and slopes of the borrow area. Include description of measures to protect final contours from erosion.

PART 2 – PRODUCTS

2.1 SELECT FILL

Select fill shall comply with the criteria listed in Table 02140-1 and shall be free of debris, toxic substances, frozen materials, rocks greater than 2 inches in any dimension, roots, and organic matter.

2.2 TOPSOIL

Topsoil shall be capable of sustaining vegetative growth. Topsoil may be natural, friable soil that is representative of soils in the vicinity which produce heavy growths of crops, grass, or other vegetation and is reasonably free from underlying subsoil, clay lumps, objectionable weeds, litter, brush, matted

roots, toxic substances, or any material that might be harmful to plant growth or be a hindrance to grading, planting, or maintenance operations.

Topsoil may be generated by amending soil meeting the select fill requirements with organic materials such as human or animal biological wastes (biosolids), compost, lime, and fertilizer. Use of human biosolids must be approved by the Contracting Officer's Representative (COR) and/or the Project Officer (PO) prior to use, and approval will be based on the area of application. Contractor must meet testing requirements provided by EPA to verify that application of biosolids will not recontaminate the soils. Topsoil shall also comply with the criteria listed in Table 02140-1.

TABLE 02140-1
REQUIRED PHYSICAL PROPERTIES OF SELECT FILL AND TOPSOIL

Property	Test Value	Test Method
Select Fill:		
Soil classification (USCS)	CL, ML, CH, or MH	ASTM D 2487
Max. particle size (inches)	2	ASTM D 422
Topsoil:		
Max. particle size (inches)	1	ASTM D 422
pH	5-8	ASTM D 4972
Organic content (%)	5-10	ASTM D 2974

The pH and organic content ranges may be modified based on recommendations from the Cherokee County Extension Service. However, the changes shall be made in writing and approved by the COR and/or the PO.

PART 3 – EXECUTION

3.1 BORROW SOURCE TESTING

3.1.1 Select Fill

3.1.1.1 Classification Testing

Borrow source tests shall be performed on each principal type or combination of materials proposed for use in the select fill layer to ensure compliance with specified requirements. One set of borrow source tests per each fraction of 15,000 cubic yards shall be performed on borrow soil proposed for use. A set of borrow source tests shall consist of Atterberg limits (ASTM D 4318), particle size analysis (ASTM D 422), and moisture content (ASTM D 2216). Based on borrow source testing, soils shall be classified in accordance with ASTM D 2487.

3.1.1.2 Moisture-Density (Compaction) Testing

Representative samples from each principal type or combination of borrow materials shall be tested to establish compaction curves using ASTM D 698. One compaction test per each fraction of 15,000 cubic yards shall be performed on borrow soil proposed for use. A minimum of 4 points shall be used to develop each compaction curve. During construction, placement of select fill shall conform to the following requirements:

- The minimum allowable dry density shall be no less than 90 percent of maximum dry density.
- The moisture content at the time of placement shall range from -3 percent to +5 percent.

3.1.2 Topsoil

Testing shall be performed on representative samples of each principal type or combination of topsoil materials. One set of tests for each fraction of 7,500 cubic yards shall be performed on topsoil.

Testing shall consist of the determination of maximum particle size in accordance with ASTM D 422, pH in accordance with ASTM D 4972, and organic content in accordance with ASTM D 2974. Topsoil tests shall be performed to determine the optimal amendment addition rates to support the seed mixture specified in SECTION 02921 – SEEDING.

3.1.3 Chemical Testing

Borrow used for the select fill and topsoil layers shall be free of contamination. Each proposed borrow source shall be sampled and analyzed for the Target Analyte List (TAL) Metals (EPA Methods 6010/7470/7471). Chemical testing shall be performed on select fill for each fraction of 15,000 cubic yards and on topsoil for each fraction of 7,500 cubic yards. TAL metals concentrations less than the cleanup levels for the project of: cadmium – 10 parts per million (ppm), lead – 400 ppm, and zinc – 1,100 ppm will be considered acceptable for use.

3.2 INSTALLATION

3.2.1 Select Fill Placement

Select fill shall be placed as cover directly over excavated areas. The loose lift thickness of each subsequent lift shall be no greater than 8 inches. Select fill shall be compacted with a minimum of 2 passes with kneading-type compaction equipment. The top surface of the select fill layer shall be scarified prior to placement of the subsequent layers. Select fill shall be used to construct earth berms and embankments as required for construction.

3.2.2 Topsoil Placement

Topsoil shall be placed over the select fill in waste excavation areas. Topsoil shall not be placed when the subgrade is frozen, excessively wet, extremely dry, or in a condition otherwise detrimental to proper grading. Topsoil shall be placed in one lift and shall be evenly spread to a final compacted thickness of not less than 6 inches. Topsoil shall be traffic-compacted using approved placement equipment. On slopes, topsoil shall be placed from the bottom of the slope upward. Organic soil amendments, if required, shall be thoroughly blended in the topsoil layer or the top 6 inches of the select fill layer.

3.2.3 Maintenance Monuments

Not used

3.3 CONSTRUCTION TOLERANCES

3.3.1 Finished surfaces shall be uniformly graded and shall be free from depressions, mounds, or windrows.

3.3.2 Surveys shall be performed at each former railway segment. The Contractor shall divide each completed work area into 50-foot by 50-foot grids minimum depending on the surface acreage of each disturbed work area. Survey work shall be performed in accordance with SECTION 01721 – SURVEY REQUIREMENTS.

3.4 CONSTRUCTION TESTS

3.4.1 Select Fill and Topsoil Material Tests

For the select fill layer, representative samples shall be taken for testing at the frequencies listed in Table 02140-2 from the borrow source. Test results shall comply with the requirements listed in PART 2 – PRODUCTS or the material will be rejected for use.

TABLE 02140-2
SELECT FILL AND TOPSOIL MATERIAL TESTING FREQUENCIES

Property	Test Frequency	Test Method
Select Fill:		
Grain size analysis	15,000 cubic yards	ASTM D 422
Atterberg limits	15,000 cubic yards	ASTM D 4318
Laboratory Compaction Characteristics	15,000 cubic yards	ASTM D 698
Topsoil:		
Grain size analysis for max particle size	7,500 cubic yards	ASTM D 422
pH	7,500 cubic yards	ASTM D 4972
Organic content	7,500 cubic yards	ASTM D 2974

3.4.2 Moisture Content and Density Tests of In-Place Select Fill

Moisture content and density tests shall be performed in accordance with Table 02140-3. Density requirements shall be as specified in Paragraph 3.1.1.2, but will not be enforced for the first lift of the select fill layer.

TABLE 02140-3
MOISTURE CONTENT AND DENSITY TESTS OF IN-PLACE SELECT FILL

Property	Test Frequency per Lift	Test Method
Moisture Content	10,000 square feet	ASTM D 3017
Density	10,000 square feet	ASTM D 2922

3.4.2.1 Test Frequencies and Locations

Nuclear density and moisture content tests shall be checked at the frequencies shown in Table 02140-3. The locations and results of each test shall be documented by the Contractor. The COR and/or the PO may elect to select test locations.

3.4.2.2 Nuclear Density and Moisture Content Tests

Nuclear density readings shall be taken in the direct transmission mode. Nuclear density and moisture calibration curves shall be checked and adjusted in accordance with the procedures described in ASTM D 2922 and ASTM D 3017. The nuclear gauge calibration checks shall be made at the beginning of a job, on each different type of material to be placed, and at intervals as directed. Nuclear density and moisture content gauges shall also be standardized daily in accordance with ASTM D 2922 and ASTM D 3017.

3.4.2.3 Test Results

Field moisture content and density test results shall be compared to the compaction curve for the appropriate material type being tested. If test results are not within the acceptable range for moisture content or density, as described in Paragraph 3.1.1.2, three additional tests shall be performed near the location of the failed parameter. If all retests pass, no additional action shall be taken. If any of the retests fail, the lift of soil shall be removed to the limits defined by passing tests for that parameter, replaced, and recompacted. The area shall then be retested as directed.

3.5 PROTECTION

3.5.1 Damage

Erosion rills that exceed 1 inch in depth or other damage that occurs within the life of the contract shall be repaired and grades re-established at no additional cost to the Government until vegetation is established. Repairs to the select fill layer or topsoil layer shall be documented including location and volume of soil affected, corrective action taken, and results of retests.

3.5.2 Stockpiles

Storage or stockpiling of any material on the completed surface of the topsoil layer will not be permitted.

3.6 BORROW AREA RESTORATION

Borrow areas not located within the work areas shall be graded to provide positive surface drainage and reseeded in accordance with the Borrow Area Excavation and Restoration Plan. Seeding shall be performed in accordance with SECTION 02921 – SEEDING.

END OF SECTION

SECTION 02141

DEWATERING AND DRAINAGE

PART 1 – GENERAL

1.1 SCOPE OF WORK

1.1.1 Provide all dewatering necessary to keep the construction and work areas dry. Design, install, operate, and maintain an adequate system. Provide a system of sufficient size and capacity to maintain a dry condition without delays to construction operations. Remove the dewatering system as required.

1.1.2 Furnish, maintain, and remove temporary surface water control measures adequate to prevent and remove surface water entering excavations.

1.1.3 Collect and properly dispose of all discharge water from the dewatering and drainage systems in an environmentally sound manner per applicable federal, state, and local regulations.

1.1.4 Remove all components of dewatering system after dewatering is complete unless otherwise indicated in the Contract Documents or approved by the Contracting Officer's Representative (COR) and/or the Project Officer (PO).

1.2 DESIGN AND PERFORMANCE RESPONSIBILITY

1.2.1 Design and execute methods for controlling surface water and groundwater.

1.2.2 Prevent all damage to properties, buildings, utilities, and pavements that may result from dewatering or surface water control operations.

1.2.3 Review of dewatering operations by the COR and/or the PO shall not relieve the Contractor of his/her responsibilities for the work.

1.3 SUBMITTALS

The Contractor shall submit the following items in accordance with the Performance Work Statement:

1.3.1 Dewatering Plan. Submit to the COR and/or the PO for review at least 2 weeks prior to the start of construction in any areas of anticipated dewatering a proposed initial plan for removal of water, method of excavation, and support of excavation.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 GENERAL

3.1.1 It shall be the Contractor's responsibility to evaluate the subsurface conditions at the project site with respect to required dewatering facilities.

3.1.2 Control surface water and groundwater such that all construction, excavation, and backfill to final grade is made in the dry. Flotation of completed portions of work shall be prohibited.

3.1.3 Provide dewatering and excavation, at all times, in a manner that does not cause loss of ground or disturbance to the pipe-bearing soil or soil that supports overlying or adjacent structures.

3.1.4 When the dewatering system does not meet the specified requirements, and as a consequence, loosening or disturbance of the foundations strata, instability of the slopes or damage to foundations or structures occurs, the Contractor shall supply all materials, labor, and perform all work for restoration of foundation soil, fill soil, slopes, foundations, or structures, to the satisfaction of the COR and/or the PO, at no cost to the Government.

3.2 DEWATERING PLAN

3.2.1 At a minimum the Dewatering Plan shall include proposed dewatering methods, as specified in Paragraph 3.4 herein; methods to dispose of water from dewatering operations; reuse of water for dust control purposes, if water meets appropriate standards; and use of "dirtbag" sediment control devices and infiltration basins.

3.2.2 The initial plan may have to be modified to suit variable soil/water conditions that may be encountered.

3.2.3 Design, furnish, install, maintain, and operate a dewatering system which shall prevent loss of fines, boiling, quick conditions, or softening of foundation strata and maintain stability of bottoms of excavations so that every phase of the work can be performed in the dry. The dewatering operations shall be such that the bottoms of all excavations shall be kept at all times firm, and in all respects acceptable to the COR and/or the PO as good foundation.

3.3 SURFACE WATER CONTROL

Construct surface water control measures, including dikes, ditches, sumps, and other methods to prevent, as necessary, flow of surface water into excavations.

3.4 DEWATERING

3.4.1 Furnish and maintain proper equipment and facilities to properly and promptly remove and dispose of all water entering excavations. Keep excavations dry, so as to obtain a satisfactory undisturbed subgrade foundation condition until the fill, structure, or pipes, to be built thereon have been completed to such extent that they will not be floated or otherwise damaged by allowing water levels to return to natural elevations.

3.4.2 Do not construct pipe or other structures in water or allow it to be submerged within 24 hours after being placed. Do not allow water to flow over new masonry within 4 days after placement.

3.4.3 In no event shall water rise to cause unbalanced pressure on structures until the concrete or mortar has set at least 24 hours. Prevent flotation of the pipe by promptly placing backfill.

3.4.4 Conduct dewatering at all times in such a manner as to preserve the natural undisturbed capacity of the subgrade soils at proposed bottom of excavation. If the subgrade of the trench bottom or

excavation becomes disturbed due to inadequate drainage, excavate below normal grade to remove the disturbed material and refill with screened gravel.

3.4.5 Evaluate the impact of the anticipated subsurface soil/water conditions on the proposed method of excavation and removal of water.

3.4.6 Where groundwater level is above the proposed bottom of excavation level, it is expected that some type of pumped or gravity dewatering system will be required for predrainage of the soils prior to final excavation and for maintaining the lowered groundwater level until construction has been completed to such an extent that the structure, pipeline or fill will not be floated or otherwise damaged. It is further expected that the type of system, spacing of dewatering units and other details of the work will have to be varied depending on soil/water conditions at a particular location.

3.4.7 Dewatering units used in the work shall be surrounded by suitable filter sand and no fines shall be removed by pumping. Provide continuous pumping from the dewatering system until excavation is adequately backfilled. Stand by pumps shall be provided.

3.4.8 Collect water entering the excavation from precipitation or surface runoff in shallow ditches around the perimeter of the excavation. Drain water to sumps and pump the excavation to maintain a bottom free from standing water.

3.4.9 Meet all substantive requirements for disposal of excess water from dewatering operations.

3.6 REMOVAL

All elements of the dewatering system(s) shall be removed from the site at the completion of the dewatering work.

END OF SECTION

SECTION 02209

RIPRAP

PART 1 – GENERAL

1.1 SCOPE OF WORK

Furnish all labor, materials, and equipment required to install riprap protection as specified in this section and at the locations indicated on the Contract Drawings.

1.2 SUBMITTALS

The Contractor shall submit the following items in accordance with the Performance Work Statement.

1.2.1 Riprap Gradation Test Results

1.4 REFERENCES

1.4.1 The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only. Where reference is made to one of the below standards, the revision in effect at the time of bid opening shall apply.

KANSAS DEPARTMENT OF TRANSPORTATION (KDOT) STANDARD SPECIFICATIONS
Section 1114 Stone for Riprap, Ditch Lining and Other Miscellaneous Uses

PART 2 – PRODUCTS

2.1 RIPRAP

2.1.1 Riprap shall be limestone type, irregular shaped rock, solid, and non-friable. Non-mineralizing development rock (bull rock) may be substituted for riprap provided that the gradation specification is maintained. Riprap shall meet the requirements in Table 02209-1 and KDOT Section 1114.

TABLE 02209-1
RIPRAP GRADATION REQUIREMENTS

Percent Heavier Than					
Class	**½ ton**	**¼ ton**	**200 lbs**	**75 lbs**	**5 lbs**
Heavy Series					
½ Ton	50+	95+			
¼ Ton		50+		90+	
Light Series					
Light 24”			50+		90+

2.1.2 Non-mineralized development rock (bull rock) with less than 5 percent chat and tailings may be screened on site for reuse as riprap. Chat and tailings from the screening process shall be disposed

in subsidence pits or on mine waste disposal/consolidation areas in accordance with SECTION 02111 – EXCAVATION AND HANDLING OF MINE AND MILL WASTE.

2.2 WOVEN GEOTEXTILE

Geotextile materials shall conform to SECTION 02216 – GEOTEXTILES.

PART 3 – EXECUTION

3.1 Geotextile Placement

Geotextile shall be placed longitudinally along the direction of flow over substrate, lap edges, and ends as shown on the Contract Drawings and as specified by the manufacturer. Joints shall be overlapped a minimum of 12 inches and shall be pinned.

3.2 Riprap Placement

Riprap shall be placed at a uniform depth to produce a reasonable well graded mass of rock with a minimum practicable percentage of voids at the depths locations indicated on the Contract Drawings. Riprap shall be placed to its full course thickness in one lift. Large rocks shall be well distributed throughout the layer. Care shall be taken to avoid damage to the geotextile layer during riprap placement.

END OF SECTION

SECTION 02230

CLEARING AND GRUBBING

PART 1 – GENERAL

1.1 SCOPE OF WORK

1.1.1 Furnish all labor, materials, and equipment required to perform all clearing and grubbing as shown on the Contract Drawings and as specified herein.

1.1.2 Obtain all permits required for site preparation work prior to proceeding with the work, including clearing and tree removal.

1.1.3 Minimize the areas to be cleared and grubbed to the extent possible for the scope of work and in consideration of the actual means and methods of construction used. No unnecessary site preparation within these areas shall be performed.

1.1.4 Only remove trees and bushes within the limits of construction designated on the Contract Drawings. Removal of trees and bushes beyond the limits of construction designated on the Contract Drawings are subject to approval marked from the Contracting Officer's Representative (COR) and/or the Project Officer (PO).

1.1.5 Clearing shall consist of the felling, trimming, and cutting of trees into sections and the satisfactory disposal of the trees and other vegetation designated for removal, including down timber, snags, brush, rubbish, and debris occurring in the areas to be cleared. Clearing shall also include the removal and disposal of debris or structures that obtrude, encroach upon, or otherwise obstruct the work within the construction limits as shown on the Contract Drawings. Concrete structures and/or mill works structures shall remain in place unless indicated on the Contract Drawings, the Specifications, or otherwise approved by the COR and/or the PO.

1.1.6 Grubbing shall consist of the removal and disposal of stumps, roots larger than 3 inches in diameter, and matted roots from the designated grubbing areas.

1.2 SUBMITTALS

The Contractor shall submit the following in accordance with the Performance Work Statement.

1.2.1 Copies of all permits, as required, prior to clearing, grubbing, and stripping work.

1.2.2 Copies of manifests and/or shipping papers, as required in Paragraph 3.4 and SECTION 02121.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 CLEARING

3.1.1 Remove standing trees, stumps, roots, brush, and other vegetation within the limits of construction as shown on the Contract Drawings. Any trees and bushes to be preserved shall be marked using paint or plastic flagging by the COR and/or the PO. Use heavy equipment to push over trees to keep roots intact prior to disposal. If this is not feasible, cut off trees and other vegetation flush with or below the original ground surface. Clearing shall also include the removal and disposal of trash, old tires, and structures that obtrude, encroach upon, or otherwise obstruct the work.

3.1.2 For safety reasons, vegetation around subsidence pits, if encountered, shall not be removed until is has been deemed by the Contractor that conditions around the subsidence pits allow for safe removal of vegetation.

3.1.3 Clearing of brush and trees shall occur only as necessary to allow excavation and access to the excavation areas as specified in SECTION 02111 – EXCAVATION AND HANDLING OF MINE AND MILL WASTE and to restore excavated areas as specified in SECTION 02300 – EXCAVATION, BACKFILLING, AND COMPACTION.

3.1.4 The COR and/or the PO will notify the Contractor prior to start of clearing activities if the property owner requests to use the downed trees as firewood. Cleared trees that are larger than 4 inches in diameter shall be cut into lengths of 8 feet and placed neatly outside of the initial limits of construction for the property owner's use. Dispose of cleared trees smaller than 4 inches in diameter as specified in Paragraph 3.4 herein.

3.1.5 Rubbish and/or debris occurring within areas to be cleared shall be removed for disposal unless directed otherwise by the COR and/or the PO. Disposal of rubbish and/or debris shall be as specified in Paragraph 3.4 herein.

3.1.6 Trees and vegetation to be left standing shall be protected from damage incident to clearing, grubbing, and construction operations by the erection of barriers or by such other means as the circumstances require. Preserve and protect vegetation adjacent to streams, ponds, or lakes from damage unless within initial excavation limits as specified in Paragraph 3.5 herein. The minimum exclusion radius for trees and vegetation to be left standing shall be in accordance with Table 02111-1 in SECTION 02111 – EXCAVATION AND HANDLING OF MINE AND MILL WASTE.

3.2 GRUBBING

3.2.1 Material to be grubbed, together with logs and other organic or metallic debris, shall be removed to a depth of not less than 12 inches below the original surface level of the ground in areas indicated in the Contract Documents or as directed by the COR and/or the PO to be grubbed. Depressions made by grubbing shall be filled with suitable material and compacted to make the surface conform to the original adjacent ground surface.

3.2.2 Grub and remove all stumps, roots in excess of 3-inches in diameter, matted roots, brush, timber, logs, concrete rubble, and other debris encountered to a depth of 18 inches below original grade or 18 inches beneath the bottom of foundations, whichever is greater.

3.3 TREE REMOVAL

Trees and stumps shall be removed from within the limits of construction as shown on the Contract Drawings. This work shall include the felling of such trees and the removal of their stumps and roots as specified in Paragraph 3.2. Trees shall be disposed of as specified in Paragraph 3.4.

3.4 DISPOSAL OF MATERIALS

Clearing and grubbing materials shall be disposed in accordance with SECTION 02121 – TRANSPORTATION AND DISPOSAL OF WASTE MATERIALS. This includes submittal of manifests and/or shipping papers associated with shipment of waste materials, including verification of receipt by the receiving facility, as required in SECTION 02121.

3.5 TREE PROTECTION

3.5.1 Trees and other vegetation to remain shall be protected from damage by all construction operations through erection of suitable barriers, guards, and enclosures, or by other approved means. Tree clearing operations determined by the Contractor to be necessary within the limits of construction as shown on the Contract Drawings, shall be conducted in a manner to prevent falling trees from damaging trees and vegetation to remain and to the work being constructed. Clearing operations shall be conducted in a manner so as to provide for safety of employees, the general public, and all others who may be impacted. Clearing and construction operations shall be in accordance with the exclusion radius procedure in SECTION 02111 – EXCAVATION AND HANDLING OF MINE AND MILL WASTE.

3.5.2 Maintain protection until all work in the vicinity has been completed.

3.5.3 Heavy equipment operation or stockpiling of materials shall not be permitted within the branch spread (drip line) of existing trees to remain, unless approved by the COR and/or the PO.

3.5.4 Restrict construction activities to those areas within the limits of construction designated on the Contract Drawings, within public rights of way, and within easements provided by the Government. Adjacent properties and improvements thereon, public or private, which become damaged by construction operations, shall be promptly restored to their original condition, to the full satisfaction of the COR and/or the PO at no additional cost to the Government.

END OF SECTION

SECTION 02300

EXCAVATION, BACKFILLING, AND COMPACTION

PART 1 – GENERAL

1.1 SCOPE OF WORK

Excavation shall be required to provide fill materials from off-site borrow sources. Excavated materials shall be used as backfill material to establish proper drainage and to construct earth berms and embankments. Excavated soil meeting the requirements of SECTION 02140 – COVER SOIL may be used to cover the mine waste disposal/consolidation areas. SECTION 02111– EXCAVATION AND HANDLING OF MINE AND MILL WASTES shall be used for the excavation and handling of mine waste and former railroad embankment materials.

PART 2 – PRODUCTS (NOT USED)

PART 3 – EXECUTION

3.1 STRIPPING OF TOPSOIL

Where indicated in the Contract Documents, topsoil shall be stripped and stockpiled for future use. Topsoil shall be kept separate from other excavated materials, brush, litter, objectionable weeds, roots, stones larger than 1 inch in diameter, and other materials that would interfere with planting and maintenance operations.

3.2 GENERAL EXCAVATION

The Contractor shall perform excavation of every type of material encountered within the limits of the construction project to the lines, grades, and elevations indicated on the Contract Drawings and as specified. Grading shall be in conformity with the typical sections shown and the tolerances specified in Paragraph 3.11. Excavated materials shall be transported to and placed in fill or areas within the limits of the construction. Surplus excavated material not required for fill shall be disposed of in areas approved for surplus material storage or designated waste areas. During construction, excavation and fill shall be performed in a manner and sequence that will provide proper drainage at all times.

3.2.1 Ditches

Excavation of ditches shall be accomplished by cutting accurately to the cross sections, grades, and elevations shown on the Contract Drawings. Ditches shall not be excavated below the grades shown. Excavated material shall be placed as shown or as directed, except that in no case shall material be deposited less than 4 feet from the edge of a ditch. The Contractor shall maintain excavations free from detrimental quantities of leaves, brush, sticks, trash, and other debris until final acceptance of the work.

3.3 HANDLING OF STOCKPILED MATERIAL

3.3.1 Stockpiles shall be constructed to isolate stored contaminated material from the environment. Excavated mine waste may be temporarily stockpiled, as necessary, only at the mine waste disposal/consolidation area locations shown on the Contract Drawings and specified in SECTION

02111 – EXCAVATION AND HANDLING OF MINE AND MILL WASTE. Excavated contaminated material may be temporarily stockpiled at other locations only with written approval from the Project Officer and Field Representative.

3.3.2 Erosion control for stockpile locations shall be as specified in SECTION 02910 – EROSION CONTROL.

3.3.3 Dust control for stockpiles shall be as specified in SECTION 01490 – ENVIRONMENTAL PROTECTION.

3.4 SELECTION OF BORROW MATERIAL

Borrow material shall be selected to meet the requirements and conditions of the particular fill for which it is to be used. Off-site borrow material shall be obtained from the borrow areas selected by the Contractor. Unless otherwise provided in the Contract, the Contractor shall obtain from the borrow area property owners the right to procure material, pay royalties and other charges involved, and bear the expense of developing the sources, including rights-of-way for hauling, if required. Necessary clearing, grubbing, and satisfactory drainage of borrow pits and the disposal of debris thereon shall be considered related operations to the borrow excavation.

3.5 OPENING AND DRAINAGE OF EXCAVATION

Except as otherwise permitted, adequate drainage shall be provided for borrow pits and other excavation areas. Borrow pits shall be neatly trimmed and drained after the excavation is completed. The Contractor shall ensure that excavation of any area, operation of borrow pits, or dumping of spoil material results in minimum detrimental effects on natural environmental conditions.

3.6 GRADING AREAS

Where indicated in Contract Documents, work will be divided into grading areas within which satisfactory excavated material shall be placed in embankments, fills, and required backfills.

3.7 BACKFILL

Backfill shall be placed in loose lifts not exceeding 8-inches in thickness, compacted to at least 90 percent laboratory maximum density for cohesive materials, and shall be in accordance with the compaction testing requirements listed in SECTION 02140 – COVER SOIL. The ground surface on which backfill is to be placed shall be prepared as specified in Paragraph 3.9 herein. Subsidence pits shall be filled in accordance with SECTION 02111– EXCAVATION AND HANDLING OF MINE AND MILL WASTE

3.8 SUBGRADE PREPARATION

Subgrade shall be shaped to line, grade, and cross section, and compacted as specified or indicated on the Contract Drawings. The excavated areas shall be regraded as necessary to provide positive surface drainage, with cross slopes as shown on the Contract Drawings. This operation shall include plowing, disking, and any moistening or aerating required to obtain specified compaction. Soft, unstable, or otherwise unsatisfactory material shall be removed and replaced with satisfactory excavated material or other approved material. Low areas resulting from removal of unsatisfactory material or excavation of rock shall be brought up to required grade with satisfactory materials, and the entire subgrade shall be

shaped to line, grade, and cross section and compacted as specified. Subgrade elevations may be adjusted during Contract activities based on the quantities of materials designated for removal. Actual subgrade elevations shall be documented by completion of surveys required by the Performance Work Statement and Specification 01721 – SURVEY REQUIREMENTS.

3.9 PREPARATION OF GROUND SURFACE

3.9.1 General Requirements

Ground surface on which fill is to be placed shall be stripped of live, dead, or decayed vegetation, rubbish, debris, and other unsatisfactory material; pulverized; moistened or aerated as necessary to a depth of 8-inches; thoroughly mixed; and compacted to at least 90 percent laboratory maximum density for cohesive materials in accordance with the compaction testing requirements in SECTION 02140 – COVER SOIL. The prepared ground surface shall be horizontal and scarified and moistened or aerated as required just prior to placement of fill materials to assure adequate bond between fill material and the prepared ground surface.

3.9.2 Frozen Material

Backfill shall not be placed on a foundation which contains frozen material, or which has been subjected to freeze-thaw action. This prohibition encompasses all foundation types, including the natural ground, all prepared subgrade and all layers of previously placed and compacted earth fill which become the foundations for successive layers of earth fill. All material that freezes or has been subjected to freeze-thaw action during the construction work, or during periods of temporary shutdowns, such as, but not limited to, nights, holidays, weekends, winter shutdowns, or earthwork operations, shall be removed to a depth that is acceptable to the Contracting Officer's Representative (COR) and/or the Project Officer (PO) and replaced with new material. Alternatively, the material will be thawed, dried, reworked, and recompacted to the specified criteria before additional material is placed. Fill material shall not contain frozen clumps of soil, snow, or ice.

3.10 BERMS AND EMBANKMENTS

Earth berms and embankments shall be constructed using select fill free of organic or frozen material and rocks with any dimension greater than 2 inches. The material shall be placed in successive horizontal layers of loose material not more than 8 inches in thickness. Each layer shall be spread uniformly on a soil surface that has been moistened or aerated as necessary, and scarified or otherwise broken up so that the fill will bond with the surface on which it is placed. Berms and embankments shall be constructed on native soil; mine waste shall be removed. After spreading, each layer shall be plowed, disked, or otherwise broken up; moistened or aerated as necessary; thoroughly mixed; and compacted to at least 90 percent laboratory maximum density for cohesive materials in accordance with the compaction testing requirements in SECTION 02140 – COVER SOIL. Surfaces of berms and embankments may require topsoil or amended soil to promote vegetative growth.

3.11 FINISHING

The surface of excavations, embankments, and subgrades shall be finished to a smooth and compact surface in accordance with the lines, grades, and cross sections or elevations shown. The degree of finish for graded areas, excluding waste consolidation areas, shall be within 0.1 foot of the grades and elevations indicated on the Contract Drawings except that the degree of finish for subgrades shall be specified in Paragraph 3.8 herein. Gutters and ditches shall be finished in a manner that will result in

effective drainage. The degree of finish for waste consolidation areas shall be consistent with the Performance Work Statement and SECTION 01721 – SURVEY REQUIREMENTS. The surface of areas to be seeded shall be finished to a smoothness suitable for the application of seeding materials in accordance with SECTION 02921 – SEEDING.

3.12 TESTING

Off-site borrow soil shall be tested as described in SECTION 02140– COVER SOIL. Testing shall be performed by an approved commercial testing laboratory or by the Contractor if approved by the COR and/or the PO. Density testing for placed backfill for berms and embankments and shall be required to assure that the proper compaction has been performed. Density testing for backfill placement shall be performed at a rate of 1 test per 10,000 square feet per 8-compacted inch lift.

3.13 SUBGRADE AND EMBANKMENT PROTECTION

During construction, embankments and excavations shall be kept shaped and drained. Ditches and drains along subgrade shall be maintained to drain effectively at all times. The finished subgrade shall not be disturbed by traffic or other operation and shall be protected and maintained by the Contractor in a satisfactory condition until channel lining is established.

END OF SECTION

SECTION 02618

STORM DRAINAGE

PART 1 – GENERAL

1.1 SCOPE OF WORK

1.1.1 Furnish all labor, materials, equipment, and incidentals required to install high density polyethylene (HDPE) pipe at the locations shown on the Contract Drawings and as specified herein.

1.1.2 Furnish all labor materials, equipment, and incidentals required to construct the drainage channel improvements shown on the Contract Drawings and as specified herein.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only. Where reference is made to one of the below standards, the revision in effect at the time of bid opening shall apply.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D2657	Standard Practice for Heat-Joining Polyolefin Pipe and Fittings
ASTM D3350	Specification for Polyethylene Plastics, Pipe, and Fittings Materials
ASTM F667	Standard Specification for Large-Diameter Corrugated Polyethylene Pipe and Fittings
ASTM F714	Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter

AMERICAN ASSOCIATION OF STATE HIGHWAY & TRANSPORTATION OFFICIALS (AASHTO)

AASHTO M – 294	Standard Specification for Corrugated Polyethylene Pipe (12 to 60-in)

MISCELLANEOUS

State of Kansas Department of Transportation (KDOT) - Design Manual, Volume I (Part A & B), Road Section.

State of Kansas Department of Transportation - Standard Specifications for State Road and Bridge Construction

State of Kansas Department of Transportation - Standard Drawings

1.3 SUBMITTALS

The Contractor shall submit the following items in accordance with the Performance Work Statement.

1.3.1 The name of the pipe suppliers, a list of materials to be furnished, and the date of delivery of materials to the site.

The submittal shall include the following:

- Shop drawings showing layout, joint, method of manufacture and installation of pipe and a schedule of pipe lengths.
- Prior to shipment of pipe, submit certified test reports that the pipe used for this project was manufactured and tested in accordance with the ASTM and/or AASHTO standards specified herein.
- Printed copies of the manufacturer's recommendations for installation procedures of the material being placed, prior to installation.

1.3.2 Certificates

- Resin Certification
- Determination of Density
- Certified copies of test reports demonstrating conformance to applicable pipe specifications, before pipe is installed.

1.4 QUALITY ASSURANCE

Inspection of the pipe may be made by the Contracting Officer's Representative (COR) and/or the Project Officer (PO) at the point of fabrication or after delivery. The pipe shall be subject to rejection at any time on account of failure to meet the requirements of Paragraph 2.1, herein, even though pipes may have been accepted as satisfactory at the place of fabrication. Pipe rejected after delivery shall be marked for identification and removed from the job site. All HDPE pipe and fittings shall be from a single manufacturer.

1.4.1 Delivery and Storage

Materials delivered to site shall be inspected for damage, unloaded, and stored with a minimum of handling. Materials shall not be stored directly on the ground. The inside of pipes and fittings shall be kept free of dirt and debris. Before, during, and after installation, pipe and fittings shall be protected from any environment that would result in damage or deterioration to the material. The Contractor shall have a copy of the manufacturer's instructions available at the construction site at all times and shall follow these instructions unless directed otherwise by the COR and/or the PO.

1.4.2 Handling

Materials shall be handled in a manner that ensures delivery to the trench in sound, undamaged condition. Pipe shall be carried to the trench, not dragged.

1.5 WARRANTY

The pipe material manufacturer shall provide an unconditional extended warranty for the pipe covering the cost of materials for repair or replacement plus installation manpower should the pipe fail within the warranty period. The manufacturer's extended warranty shall be for ten years after the final acceptance of the project by the Government. The manufacturer shall guarantee that the pipe furnished is suitable for the purpose intended and free from defects of material and workmanship for the duration of the extended warranty. In the event the pipe fails to perform as specified, the pipe manufacturer shall promptly replace defective pipe at no additional cost to the Government.

PART 2 – PRODUCTS

2.1 CORRUGATED HDPE PIPE

2.1.1 Corrugated HDPE pipe shall have an annular corrugated exterior and smooth inner wall.

2.1.2 HDPE pipe resins shall be high molecular weight, high density polyethylene with a cell classification of 345434C in accordance with ASTM D3350.

2.1.3 Corrugated pipe, flared end sections, and appurtenances shall be HDPE of the size and type as shown on the Contract Drawings, all manufactured by the same company and shall meet or exceed the following specifications: AASHTO M-294, ASTM F667, and ASTM F714.

2.1.4 Backfilling over the pipe shall be to the pipe manufacturer's specifications.

2.2 FITTINGS FOR CORRUGATED HDPE

2.2.1 All joints shall meet the requirements of a silt-tight joint. Silt-tight joints must be designated to pass a laboratory test of at least 14 kPa (2 psi).

2.3 RIPRAP

Provide nonerodible rock in the locations shown on the Contract Drawings and in conformance with SECTION 02209 – RIPRAP. Riprap shall be graded with sufficient small rocks to provide a dense mass.

PART 3 – EXECUTION

3.1 GENERAL

3.1.1 Care shall be taken in loading, transporting and unloading to prevent injury to the pipe or fittings and the joint surfaces. Pipe or fittings shall not be dropped. All pipe or fittings shall be examined before placement and no piece shall be installed which is found to be defective.

3.1.2 As soon as the excavation is completed to the normal grade of the bottom of the trench, place gravel bedding in the trench and the pipe shall be firmly bedded in this gravel bedding to conform accurately to the lines and grades indicated on the Contract Drawings. Blocking under the pipe will not be permitted. Initial backfill shall be placed evenly on each side of the pipe in 6-inch lifts, and hand tools shall be used where needed to give firm continuous support for the pipe.

3.1.3 For helically corrugated pipe, ends shall bolt together. Keep dirt and gravel out of the joint so that corrugations will fit snugly. As the jointing band is tightened, tap it with a mallet to take up slack and ensure a tight joint.

3.1.4 Holding the pipe section securely in place with jacks or come-alongs, place screened gravel backfill bringing it up evenly on both sides of the pipe. Compact the backfill as it is placed. Continue backfilling and compacting until screened gravel is a minimum of 6 inches above crown of pipe.

3.1.5 Carefully regulate the equipment and construction operations such that the loading of the pipe does not exceed the loads for which the pipe is designed and manufactured. Any pipe damaged during

construction operations shall promptly and satisfactorily be repaired or replaced at the Contractor's expense.

3.2 EXCAVATION FOR PIPE CULVERTS

Excavation of trenches, and for appurtenances and backfilling for culverts and storm drains, shall be in accordance with the applicable portions of SECTION 02300 – EXCAVATION, BACKFILLING, AND COMPACTION and the requirements specified herein.

3.2.1 Trenching

The width of trenches at any point below the top of the pipe shall be not greater than the outside diameter of the pipe plus 12 inches to permit satisfactory jointing and thorough tamping of the gravel bedding under and around the pipe. Sheeting and bracing, where required, shall be placed within the trench width as specified. The Contractor shall not over-excavate. Where trench widths are exceeded, redesign with a resultant increase in cost of stronger pipe or special installation procedures will be necessary. Cost of this redesign and increased cost of pipe or installation shall be borne by the Contractor without additional cost to the Government.

3.2.2 Removal of Rock

Rock in either ledge or boulder formation shall be replaced with suitable materials to provide a compacted earth cushion having a thickness between unremoved rock and the pipe of at least 8 inches or ½ inch for each foot of fill over the top of the pipe, whichever is greater, but not more than 75 percent of the nominal diameter of the pipe.

3.2.3 Removal of Unstable Material

Where wet or otherwise unstable soil incapable of properly supporting the pipe is unexpectedly encountered in the bottom of a trench, such material shall be removed to the depth required and replaced to the proper grade with select gravel bedding, compacted as provided in the Paragraph 3.6. When removal of unstable material is due to the fault or neglect of the Contractor, such removal and replacement shall be performed at no additional cost to the Government.

3.3 PIPE BEDDING

HDPE pipe shall be installed in accordance with the instructions of the manufacturer and as shown on the Contract Drawings. Pipe shall be laid to the lines and grades shown on Contract Drawings with gravel bedding and backfill as shown on the Contract Drawings. As soon as the excavation is complete to normal grade of the bottom of the trench, gravel bedding shall be placed and graded to provide continuous support for the pipe.

3.4 PLACING PIPE

3.4.1 Each pipe shall be thoroughly examined before being laid; defective or damaged pipe shall not be used. Pipelines shall be laid to the grades and alignment indicated. Proper facilities shall be provided for lowering sections of pipe into trenches. Pipe shall not be laid in water and pipe shall not be laid when trench conditions or weather are unsuitable for such work. Diversion of drainage or dewatering of trenches during construction shall be provided as necessary. The maximum allowable deflection of installed flexible pipe shall not exceed 5 percent.

3.4.2 Not less than 30 days after the completion of backfilling, the Government may perform a deflection test on the entire length of installed flexible pipe using a mandrel or other suitable device. Installed flexible pipe showing deflections greater than those indicated above shall be retested by a run from the opposite direction. If the retest also fails, the suspect pipe shall be replaced by the Contractor at no cost to the Government.

3.4.3 Corrugated HDPE Pipe

As soon as excavation is completed to the bottom of the trench, the Contractor shall place 6-inches of screened gravel in the trench. The pipe shall then be pulled into place on the gravel bedding. The pipe shall be weighted by a continuous flexible steel plate with stainless steel straps. The pulling cable shall be attached to a sled clamped to the lead pipe which will protect the pipe during the pulling operation. The steel plate shall be designed to resist buoyant forces when the pipe is empty. The Contractor shall provide drawings and design calculations of the weighting system bearing the stamp of a professional engineer registered in the State of Kansas.

3.5 PIPE JOINTING

3.5.1 HDPE Pipe Field Joints

Before any joint is made, the pipe shall be checked to assure that a close joint with the next adjoining pipe has been maintained and that the inverts are matched and conform to the required grade. The pipe shall not be driven down to grade by striking it. The HDPE pipe shall be joined by the method of thermal butt fusion, as outlined in ASTM D2657. All joints shall be made in strict compliance with the manufacturer's recommendations. All heat fusion joints shall be done by a factory qualified joining technician as designated by the pipe manufacturer with a minimum of three years experience for the fusion equipment to be used. When cutting pipe is required, the cutting shall be done by machine, leaving a smooth cut at right angles to the axis of the pipe.

3.6 TRENCH BACKFILLING

3.6.1 Backfilling Pipe in Trenches

After the pipe has been properly bedded, selected material from excavation or borrow, at a moisture content that will facilitate compaction, shall be placed along both sides of pipe in layers not exceeding 6 inches in compacted depth. The compacted earth backfill shall be brought up evenly on both sides of pipe for the full length of pipe. The fill shall be thoroughly compacted under the haunches of the pipe. Each layer shall be thoroughly compacted with mechanical tampers or rammers. This method of filing and compacting shall continue until the fill has reached an elevation of at least 2 feet above the top of the pipe. The remainder of the trench shall be backfilled and compacted by spreading and rolling or compacted by mechanical rammers or tampers in layers not exceeding 6 inches. Tests for density shall be made as necessary to ensure conformance to the compaction requirements specified in SECTION 02140 – COVER SOIL.

3.6.2 Movement of Construction Machinery

When compacting by rolling or operating heavy equipment parallel with the pipe, displacement of or damage to the pipe shall be avoided. Movement of construction machinery over a culvert or storm drain pipe at any stage of construction shall be at the Contractor's risk. Any damaged pipe shall be repaired or replaced at no cost to the Government.

END OF SECTION

SECTION 02910

EROSION AND SEDIMENT CONTROL

PART 1 – GENERAL

1.1 SCOPE OF WORK

1.1.1 Furnish all labor, materials, equipment, tools, supervision, and incidentals necessary to provide erosion and sediment control to excavation areas and other areas disturbed by construction activities as specified herein.

1.1.2 The Contractor shall implement the storm water pollution prevention measures specified in this Specification Section in a manner which will meet the requirements of SECTION 01490 – ENVIRONMENTAL PROTECTION.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only. Where reference is made to one of the below standards, the revision in effect at the time of bid opening shall apply.

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM D 4439	Standard Terminology for Geosynthetics
ASTM D 4491	Standard Test Methods for Water Permeability of Geotextiles by Permittivity
ASTM D 4533	Standard Test Method for Trapezoid Tearing Strength of Geotextiles
ASTM D 4632	Standard Test Method for Grab Breaking Load and Elongation of Geotextiles
ASTM D 4751	Standard Test Method for Determining Apparent Opening Size of a Geotextile

1.3 SUBMITTALS

The Contractor shall submit the following items in accordance with the Performance Work Statement.

1.3.1 Erosion and Sediment Control Inspection Reports

1.3.2 Silt Fence Fabric

Contractor shall provide manufacturer's literature discussing physical characteristics and installation instructions and certification from supplier that materials furnished meet the requirements of this Specification Section.

1.3.3 Erosion Control Blanket

Contractor shall provide manufacturer's literature discussing physical characteristics and installation instructions and certification from supplier that materials furnished meet the requirements of this Specification Section.

1.3.4 Straw Wattles

Contractor shall provide manufacturer's literature discussing physical characteristics and installation instructions and certification from supplier that materials furnished meet the requirements of this Specification Section.

1.3.5 Straw Bales

Contractor shall provide certification from supplier that materials furnished meet the requirements of this Specification Section.

1.4 EROSION AND SEDIMENT CONTROLS

The controls and measures required by the Contractor are described below.

1.4.1 Stabilization Practices

The stabilization practices to be implemented shall include temporary seeding, mulching, protection of trees, and preservation of mature vegetation. The Contractor shall record the dates when the major grading activities occur, (e.g., clearing and grubbing, outwash tailings removal, chat pile grading); when construction activities temporarily or permanently cease on a portion of the site; and when stabilization practices are initiated. Except as provided in Paragraphs 1.4.1.1 and 1.4.1.2 herein, stabilization practices shall be initiated as soon as practicable, but no more than 14 days, in any portion of the work areas where construction activities have temporarily or permanently ceased.

1.4.1.1 Unsuitable Conditions

Initiate stabilization measures within fourteen days of stopping construction activity. If initiation of stabilization measures is precluded by unsuitable conditions caused by the weather, stabilization practices shall be initiated as soon as practicable after conditions become suitable.

1.4.1.2 No Activity for Less Than 21 Days

Where construction activity will start within 21 days from when previous activities ceased, stabilization measures do not have to be initiated.

1.4.2 Structural Practices

Structural practices shall be implemented to divert flows from exposed soils, temporarily store flows, or otherwise limit runoff and the discharge of pollutants from exposed areas of the site. Structural practices shall be implemented in a timely manner during the construction process to minimize erosion and sediment runoff. Structural practices shall include the following devices. Location and details of installation and construction are shown on the Contract Drawings. Additional locations may be required based on site conditions and actions.

1.4.2.1 Silt Fences

The Contractor shall provide silt fences as a temporary structural practice to minimize erosion and sediment runoff. Silt fences shall be properly installed to effectively retain sediment immediately after completing each phase of work where erosion would occur in the form of sheet and rill erosion (e.g.

clearing and grubbing, outwash excavation, capping, and grading). Additional silt fence may be required based on site conditions and actions. Final removal of silt fence barriers shall be based upon the final inspection and acceptance of vegetation as described in SECTION 02921 - SEEDING.

1.4.2.2 Erosion Control Blanket

The Contractor shall provide erosion control blankets to provide erosion protection and vegetation establishment in channels.

1.4.2.3 Straw Wattles

The Contractor shall provide straw wattles to provide erosion protection and vegetation establishment on slopes.

1.4.2.4 Straw Bales

The Contractor shall provide straw bales as a temporary structural practice to minimize erosion and sediment runoff.

1.4.2.5 Sedimentation Basins

Not used

1.4.2.6 Earth Berms

Earth berms shall be utilized to divert storm water flows from off site away from the construction areas. Earth berms shall be adequately compacted to prevent failure. The earth berms shall have a maximum channel slope of 2 percent. The minimum height measured from the top of the berm to the bottom of the channel shall be 2 feet. The minimum base width shall be 6 feet and the minimum top width shall be 2 feet. The Contractor shall ensure that the earth berms are not damaged by construction operations or traffic. Earth berms shall be constructed on native soil, unless otherwise shown or specified, at the approximate locations shown on the Contract Drawings. Disturbed areas created during construction of the earth berms shall be seeded in accordance with SECTION 02921 - SEEDING.

1.4.2.7 Outlet Protection

Outlet protection shall be installed along the length of outfall channels to provide a nonerosive velocity flow to the receiving watercourse. Riprap meeting the requirements of SECTION 02209 - RIPRAP shall be used as outlet protection.

PART 2 – PRODUCTS

2.1 COMPONENTS FOR SILT FENCES

2.1.1 Filter Fabric

The geotextile shall comply with the requirements of ASTM D 4439, and shall consist of polymeric filaments which are formed into a stable network such that filaments retain their relative positions. The filament shall consist of a long-chain synthetic polymer composed of at least 85 percent by weight of

ester, propylene, or amide, and shall contain stabilizers and/or inhibitors added to the base plastic to make the filaments resistance to deterioration due to ultraviolet and heat exposure. Synthetic filter fabric shall contain ultraviolet ray inhibitors and stabilizers to provide a minimum of six months of expected usable construction life at a temperature range of 0 to 120 degrees F. The filter fabric shall meet the requirements listed in Table 02910-1.

TABLE 02910-1
FILTER FABRIC FOR SILT FENCE

PHYSICAL PROPERTY	TEST PROCEDURE	STRENGTH REQUIREMENT
Grab Tensile	ASTM D 4632	100 lbs. min.
Elongation (%)	ASTM D 4632	30 % max.
Trapezoid Tear	ASTM D 4533	55 lbs. min.
Permittivity	ASTM D 4491	0.2 sec-1
AOS (U.S. Std Sieve)	ASTM D 4751	20-100

2.1.2 Silt Fence Stakes and Posts

The Contractor may use either wooden stakes or steel posts for fence construction. Wooden stakes utilized for silt fence construction shall have a minimum cross section of 2 inches by 2 inches when oak is used or 4 inches by 4 inches when pine is used, and shall have a minimum length of 5 feet. Steel posts (standard "U" or "T" section) utilized for silt fence construction, shall have a minimum weight of 1.33 pounds per linear foot and a minimum length of 5 feet.

2.2 EROSION CONTROL BLANKET

2.2.1 Erosion control blanket shall be a machine-produced 100 percent biodegradable mat with a 70 percent herbaceous straw and 30 percent coconut fiber blend matrix. The blanket shall be of consistent thickness with the straw and coconut fiber evenly distributed over the entire area of the mat. The blanket shall be covered on the top and bottom sides with 100 percent biodegradable woven natural organic fiber netting. The netting shall consist of machine directional strands formed from two intertwined yarns with cross directional strands interwoven through the twisted machine strands (commonly referred to as a Leno weave) to form an approximate ½-inch by ½-inch mesh. The blanket shall be sewn together with biodegradable thread on 1.5-inch centers. Straw/coconut fiber erosion control blanket shall have the following properties:

- Matrix: 70 percent straw with approximately 0.35 pounds per square yard (lbs/yd²) weight and 30 percent coconut fiber cured in fresh water with approximately 0.15 lbs/yd² weight
- Sides: woven 100 percent biodegradable natural organic fiber with 9.3 pounds per 1,000 square feet (lbs/1,000 ft²) approximate weight
- Thread: biodegradable
- Photodegradable Life: a minimum of 24 months with a minimum 90 percent light penetration

2.2.2 Erosion Control Blanket Anchors - Erosion control anchors shall be as recommended by the manufacturer.

2.3 STRAW WATTLES

2.3.1 Wattles shall be a straw-filled tube of flexible netting material. Wattles shall be machine-produced tubes of compacted straw. The straw shall be certified weed free forage. The netting shall consist of seamless, high-density polyethylene and ethyl vinyl acetate and contain ultraviolet inhibitors.

2.3.2 Light weight rolled erosion control straw or wood fiber blankets that are rolled up to create a wattle-type material shall not be allowed.

2.3.3 The wattles shall meet the following minimum performance requirements:

- Mass per Unit Weight: 1.6 pounds per foot
- Dimension: 8 to 9 inches in diameter
- Netting: Strand thickness of 0.03 inches, knot thickness of 0.055 inches, unit weight of 0.35 ounces per foot
- Straw Fiber Length: 3 inch average
- Fiber Content: 100 percent certified weed free forage rice straw, or approved equivalent
- Sediment Retention Capacity: 30 pounds per foot as measured by rainfall simulation for a minimum of three 10-year predicted storm events on 3:1 horizontal to vertical (H:V) slopes with clayey sand type soil.
- Soil Loss: Minimum sediment yield reduction value of 58 percent as measured by rainfall simulation for a minimum of three 10-year predicted storm events on 3H:1V slopes with clayey sand type soil.
- De-Stabilizing Moisture: Maximum 11 percent moisture retained as measured by rainfall simulation for a minimum of three 10-year predicted storm events on 3H:1V slopes with clayey sand type soil.

2.4 STRAW BALES

Bales shall be either hay or straw containing 5 cubic feet or more of material, furnished in air-dry condition. All bales shall be either wire-bound or string-tied. The Contractor may use either wooden stakes or steel posts to secure the straw bales to the ground. Wooden stakes, which are used for this purpose, shall have minimum dimensions of 2 inches x 2 inches in cross section and shall have a minimum length of 3 feet. Steel posts (standard “U” or “T” section), which are used for securing straw bales, shall have a minimum weight of 1.33 pounds per linear foot and a minimum length of 3 feet.

2.5 RIPRAP

Riprap shall conform to the specifications in SECTION 02209 – RIPRAP.

PART 3 – EXECUTION

3.1 INSTALLATION OF SILT FENCES

Silt fences shall extend a minimum of 16 inches above the ground surface and shall not exceed 34 inches above the ground surface. Filter fabric shall be from a continuous roll cut to the length of the barrier to avoid the use of joints. When joints are unavoidable, filter fabric shall be spliced together at

a support post, with a minimum 6-inch overlap, and securely sealed. A trench shall be excavated approximately 4 inches wide and no less than 4 inches deep on the upslope side of the location of the silt fence. The trench shall be backfilled and the soil compacted over the filter fabric. Silt fences shall be removed upon based upon the final inspection and acceptance of vegetation as described in SECTION 02921 – SEEDING.

3.2 INSTALLATION OF EROSION CONTROL BLANKETS

3.2.1 Erosion Control Blanket (ECB) shall be installed in drainage areas and swales as shown on the Contract Drawings. Vehicles shall not be permitted on the erosion control blankets.

3.2.2 Surface Preparation

Before placing the erosion control blankets, ensure the subgrade has been graded smooth; has no depressed or void areas; is free from obstructions, such as tree roots, projecting stones or other foreign matter. Apply soil amendments, fertilizer, mulch, and seed in accordance with SECTION 02921 – SEEDING before installing the erosion control blankets.

3.2.3 Erosion control blankets shall be installed as indicated and in accordance with manufacturer's recommendations. The placement of erosion control blankets shall be as shown on the Contract Drawings.

3.2.4 Erosion control blankets shall be oriented in vertical strips and anchored using materials specified in Paragraph 2.2 herein. Adjacent strips shall be abutted to allow for installation of a common row of anchors. Horizontal joints between erosion control blankets shall be overlapped sufficiently to accommodate a common row of anchors with the uphill end on top.

3.2.5 Where exposed to overland sheet flow, a trench shall be located at the uphill termination. The erosion control blanket shall be anchored to the bottom of the trench. Backfill and compact the trench as required.

3.3 INSTALLATION OF STRAW WATTLES

3.3.1 Wattles shall be installed on the contours of slopes as shown on the Contract Drawings and in accordance with spacing requirements in Table 02910-2.

3.3.2 Surface Preparation

Proper surface preparation is essential to ensure complete contact of the wattle with the soil. Before placing the wattles, ensure the subgrade has been graded smooth; has no depressed, void areas; is free from obstructions, such as tree roots, projecting stones or other foreign matter.

3.3.3 Dig a small trench 3 to 5 inches in depth on the slope contour and perpendicular to water flow. Soil from the excavation shall be placed immediately down-slope next to the shallow trench.

3.3.4 Install wattles snugly into the trench. No gaps shall exist between the soil and the bottom of the wattle. Pack soil from trenching against the wattle on the uphill side. Abut adjacent wattles tightly, end to end, without overlapping the ends.

3.3.5 Stake the wattle at each end and four feet on center with wood stakes. Drive the first end stake of the second wattle at an angle toward the first wattle to help abut them tightly together. Stakes shall be driven through the middle of the wattle, leaving 2 to 3 inches of the stake protruding above the wattle. Wood stakes should be a minimum of 1 inch by 2 inch by 24 inches long. Metal stakes shall not be allowed. Pilot holes may be driven through the wattles into the soil, when soil conditions require.

3.3.6 Terminal ends of wattles may be staggered up the slope for containment of sediment and to prevent channelization.

TABLE 02910-2
WATTLE SPACING

SLOPE (% or H:V)	MAXIMUM SPACING (feet)
≥ 10 percent	200
< 10 and > 20 percent	100
5:1	50
4:1	40
3:1	30
2:1	20
1:1	10

3.4 INSTALLATION OF STRAW BALES

Wattles shall be installed in drainage features and on the contours of slopes as shown on the Contract Drawings and in accordance with spacing requirements in Table 02910-3.

Straw bales shall be placed in a single row, lengthwise on the contour, with ends of adjacent bales tightly abutting one another. Straw bales shall be installed so that bindings are oriented around the sides rather than along the tops and bottoms of the bales to prevent deterioration of the bindings. The barrier shall be entrenched and backfilled. A trench shall be excavated the width of a bale and the length of the proposed barrier to a minimum depth of 4 inches. After the bales are staked and chinked (gaps filled by wedging with straw), the excavated soil shall be backfilled against the barrier. Backfill soil shall conform to the ground level on the downhill side and shall be built up to 4 inches against the uphill side of the barrier. Loose straw shall be scattered over the area immediately uphill from a straw bale barrier to increase barrier efficiency. Each bale shall be securely anchored by at least two stakes driven through each bale. The first stake or steel post in each bale shall be driven toward the previously laid bale to force the bales together. Stakes or steel posts shall be driven a minimum 18 inches deep into the ground to securely anchor the bales.

TABLE 02910-3
DITCH CHECK SPACING

SLOPE (%)	MAXIMUM SPACING (feet)
1.0	200
2.0	100
3.0	65
4.0	50
5.0	40
6.0	30

3.5 MAINTENANCE

The Contractor shall maintain the temporary and permanent vegetation, erosion and sediment control measures, and other protective measures in good and effective operating condition by performing routine inspections to determine condition and effectiveness, by restoration of destroyed vegetative cover, and by repair of erosion and sediment control measures and other protective measures. The following procedures shall be followed to maintain the protective measures.

3.5.1 Silt Fence, Straw Bale, and Straw Wattle Maintenance

Silt fences, straw bales, and straw wattles shall be inspected in accordance with Paragraph 3.6 herein. Any required repairs shall be made promptly. Attention shall be paid to the repair of damaged erosion control devices resulting from end runs and undercutting. Should the fabric on a silt fence decompose or become ineffective, and the barrier is still necessary, the fabric shall be replaced promptly. Sediment deposits shall be removed when deposits reach one-third of the height of the barrier. The immediate area occupied by the fence and any sediment deposits shall be shaped to an acceptable grade.

3.5.2 Erosion Control Blanket Maintenance

Erosion control blankets shall be inspected in accordance with Paragraph 3.6 herein. Any required repairs shall be made promptly.

3.5.3 Sedimentation Basin Maintenance

Not used

3.5.4 Earth Berm Maintenance

Earth berms shall be inspected in accordance with Paragraph 3.6 herein. All debris shall be removed and properly disposed of to provide adequate flow conveyance. Any erosion of the berm shall be repaired and stabilized immediately. Close attention shall be paid to the repair of damaged earth berms and necessary repairs shall be accomplished promptly. Earth berms that are no longer required shall be removed.

3.5.5 Outlet Protection

Outlet protection shall be inspected in accordance with Paragraph 3.6 herein. Riprap aprons with excessive sedimentation accumulation, erosion below or around, or insufficient thickness shall be replaced or replenished. Repair fabric and replace riprap that has washed away and repair damage to slopes or underlying geotextile due to scour immediately.

3.6 INSPECTIONS

3.6.1 General

The Contractor shall inspect disturbed work areas of the construction site, areas used for storage of materials that are exposed to precipitation that have not been finally stabilized, stabilization practices, structural practices, other controls, and areas where vehicles exit the site at least once per week and within 24 hours of the end of any storm that produces 1 inch or more rainfall at the site. Where areas have been finally stabilized, such inspection shall be conducted once per month until the project is completed.

3.6.2 Inspections Details

Disturbed areas shall be inspected for evidence of, or the potential for, sediments entering the drainage system. Erosion and sediment control measures shall be inspected to ensure that they are operating correctly. Discharge locations or points shall be inspected to ascertain whether erosion control measures are effective in preventing significant impacts to receiving waters. Locations where vehicles exit the site shall be inspected for evidence of offsite sediment tracking.

3.6.3 Inspection Reports

For each inspection conducted, the Contractor shall prepare a report summarizing the scope of the inspection, name(s) of personnel making the inspection, the date(s) of the inspection, major observations, maintenance performed, and actions taken. The report shall be available for review by the Contracting Officer's Representative (COR) and/or the Project Officer (PO) within 24 hours of the inspection. A copy of the inspection report shall be maintained on the job site.

END OF SECTION

SECTION 02921

SEEDING

PART 1 – GENERAL

1.1 SCOPE OF WORK

1.1.1 Furnish all labor, materials, equipment, tools, supervision, and incidentals necessary to seed the areas shown on the Contract Drawings.

1.1.2 The Contractor shall seed other areas disturbed by construction activities.

1.1.3 The Contractor shall seed graded and backfilled areas with materials specified herein and as shown on the Contract Drawings. Backfilling shall be conducted in accordance with SECTION 02300 – EXCAVATION, BACKFILLING, AND COMPACTION and SECTION 02140 – COVER SOIL.

1.1.4 Install erosion control blankets at the locations shown on the Contract Drawings in accordance with SECTION -02910 – EROSION AND SEDIMENT CONTROL.

1.1.5 The Contractor is responsible for mowing vegetation until the end of the contract period, as specified herein.

1.2 REFERENCES

The publications listed below form a part of this specification to the extent referenced. The publications are referred to in the text by basic designation only. Where reference is made to one of the standards listed below, the revision in effect at the time of bid opening shall apply.

AGRICULTURAL MARKETING SERVICE (AMS)

AMS-01 Federal Seed Act Regulations Part 201

AMERICAN SOCIETY FOR TESTING AND MATERIALS (ASTM)

ASTM C 602 Standard Specification for Agricultural Liming Materials

1.3 SUBMITTALS

The Contractor shall submit the following items in accordance with the Performance Work Statement.

1.3.1 Soil Tests

Laboratory test report, prepared by the Cherokee County Extension Service, including analysis and interpretation of test results. Each report shall be properly identified. Test methods used and compliance with recognized test standards shall be described.

1.3.2 Manufacturer's Literature

Manufacturer's literature discussing physical characteristics, application, and installation instructions for equipment, surface erosion control material, and chemical treatment material.

1.3.3 Equipment List

A list of proposed herbicide application, seeding, sodding, mulching, and erosion control materials placement equipment to be used in performance of restoration, including descriptive data and calibration tests.

1.3.4 Delivery Schedule

A delivery schedule shall be provided at least 10 days prior to the intended date of the first delivery of any materials listed in Part 2 herein.

1.3.5 Certificates

Prior to the delivery of materials, certificates of compliance attesting that the materials meet the specified requirements. Certified copies of the material certificates shall include the following:

a. Seed: origin, classification, botanical name, common name, percent pure live seed, minimum percent germination and hard seed, maximum percent weed seed content, and date tested.
b. Fertilizer: chemical analysis and composition percent.
c. Organic Material: composition and source.
d. Mulch: composition and source.
e. All seed bag tags and a certification from the supplier stating that the seed complies with applicable local, state, and federal regulations.

1.3.6 Quantity Check

Bag count or bulk weight measurements of material used compared with area covered to determine the application rate and actual quantity installed.

1.3.7 Equipment Calibration Test Results

Fertilizer and seeding equipment calibration test results including data and calibration records.

1.4 SOURCE INSPECTION

The source of delivered topsoil and organic material shall be subject to inspection by the Contracting Officer's Representative (COR) and/or the Project Officer (PO).

1.5 DELIVERY, INSPECTION, STORAGE, AND HANDLING

1.5.1 Delivery

A delivery schedule shall be provided at least 10 calendar days prior to the first day of delivery.

1.5.1.1 Delivered Topsoil

Prior to the delivery of any topsoil, its availability shall be verified in Paragraph 2.3 herein. A soil test shall be provided for topsoil delivered to the site.

1.5.1.2 Soil Amendments

Soil amendments shall be delivered to the site in the original, unopened containers bearing the manufacturer's chemical analysis. In lieu of containers, soil amendments may be furnished in bulk. A chemical analysis shall be provided for bulk deliveries.

1.5.2 Inspection

Seed shall be inspected upon arrival at the job site for conformity to species and quality. Seed that is wet, moldy, or bears a test date 5 months or older, shall be rejected. Other materials shall be inspected for compliance with specified requirements. The following shall be rejected: open soil amendment containers or wet soil amendments; topsoil that contains slag, cinders, stones, lumps of soil, sticks, roots, trash or other material over a minimum 1-1/2 inch diameter; and topsoil that contains viable plants and plant parts. Unacceptable materials shall be removed from the job site.

1.5.3 Storage

Materials shall be stored in designated areas. Seed, lime, and fertilizer shall be stored in cool, dry locations away from contaminants.

1.5.4 Handling

Except for bulk deliveries, materials shall not be dropped or dumped from vehicles.

PART 2 – PRODUCTS

2.1 GENERAL

Provide all materials and equipment in suitable and adequate quantity and quality as required to accomplish the work shown and specified herein.

2.2 SEED

2.2.1 Seed Classification

Provide state certified seed of the latest season’s crop in original sealed packages bearing the producer’s guaranteed analysis for percentages of mixture, purity, germination, hard seed, weed seed content, and inert material. All seed shall be tested by a certified laboratory within 5 months of the seeding date, not counting the month of the last test date. Labels shall be in conformance with AMS-01 and applicable state seed laws. The following must appear on the label:

2.2.1.1 Lot number or other distinguishing mark.

2.2.1.2 The common name, genus, species (and subspecies, when applicable), including the name of each kind of seed present in excess of 5 percent. When two or more kinds of seed are named on the label, the label shall specify the percentage of each. When only one kind of seed is present in excess of 5 percent and no variety name or type designation is shown, the percentage must apply to seed of the kind named. If the name of the variety is given, the name may be associated with the seed of the kind named. The percentage in this case may be shown as “pure seed” and must apply only to seed of the variety named.

2.2.1.3 State or County of Origin

2.2.1.4 The approximate percentage of viable seed, together with the date of the test. When labeling mixtures, the percentage of viability of each kind shall be stated.

2.2.1.5 The approximate percent by weight of pure seed, meaning the freedom of seed from inert matter and from other seeds.

2.2.1.6 The approximate percent by weight of sand, dirt, broken seeds, chaff, and other inert matter.

2.2.1.7 The approximate total percentage by weight of other seeds.

2.2.1.8 The name and approximate number of each kind of species of prohibited and restricted noxious weed seeds occurring per pound of seed.

2.2.1.9 The full name and address of the person, firm, or corporation selling the seed.

2.2.2 Permanent Seed Species and Mixtures

Permanent native grass seed species and mixtures shall be proportioned by weight as specified in Table 02921-1.

TABLE 02921-1
PERMANENT NATIVE GRASS SEED SPECIES MIXTURE

SPECIES	APPLICATION RATE (LBS PURE LIVE SEED/ACRE)
Big Bluestem	6
Indiangrass	4.8
El Reno Sideoats grama	2.4
Switchgrass	2.4
Western Wheatgrass	4
Annual Ryegrass	4
	23.6 pounds per acre

Permanent pasture grass seed species and mixtures shall be proportioned by weight as specified in Table 02921-2.

TABLE 02921-2
PERMANENT PASTURE GRASS SEED SPECIES MIXTURE

SPECIES	APPLICATION RATE (LBS PURE LIVE SEED/ACRE)
Fungus-Free KY31 Fescue	20
Ladino White Clover	1.5
Hard Wheat	90
	111.5 pounds per acre

(Per Cherokee County Extension Office Recommendations)

2.2.3 Temporary Seed Species and Mixtures

Temporary seed species for surface erosion control shall be as specified in Table 02921-3.

TABLE 02921-3
TEMPORARY GRASS SEED SPECIES MIXTURE FOR EROSION CONTROL

SPECIES	APPLICATION RATE (LBS PURE LIVE SEED/ACRE)
Annual Ryegrass	20

2.2.3.1 Temporary seeding shall be applied to areas lacking vegetation if no construction activities will be performed in the area for more than 30 days.

2.2.3.2 Uniformly apply seed during optimum planting season and rates as specified in Table 02921-3, unless otherwise approved by the COR and/or the PO.

2.2.3.3 Do not seed in excess of that which can be mulched on same day.

2.2.4 Quality

Weed seed shall be a maximum 1 percent by weight of the total mixture.

2.2.5 Seed Mixing

The mixing of seed may be done by the seed supplier prior to delivery, or on site as directed by COR and/or the PO.

2.2.6 Substitutions

Substitutions will not be allowed without written request and approval from the COR and/or the PO.

2.3 TOPSOIL

When available, the topsoil may be the existing surface soil stripped and stockpiled onsite. When additional topsoil is required beyond the available topsoil from the stripping operation, topsoil shall be delivered and amended as recommended by the soil test for the seed specified. Onsite soil may be used as topsoil if amended with organic materials and lime to meet the requirements of SECTION 02140 - COVER SOIL. Topsoil shall be free from mine waste, slag, cinders, stones, lumps of soil, sticks, roots, trash or other material over a minimum 1-inch diameter. Topsoil shall be free from viable plants and plant parts.

2.4 SOIL AMENDMENTS

Soil amendments shall consist of pH adjuster, fertilizer, and organic material meeting the following requirements. Vermiculite shall not be used.

2.4.1 pH Adjuster

The pH adjuster shall be an agricultural liming material in accordance with ASTM C 602. These materials may be burnt lime, hydrated lime, ground limestone, sulfur, or shells. The pH adjuster shall be used to create a favorable soil pH for the plant material specified.

2.4.1.1 Limestone

Limestone material shall contain a minimum calcium carbonate equivalent of 80 percent. Gradation: a minimum 95 percent shall pass through a No. 8 sieve and a minimum 55 percent shall pass through a No. 60 sieve. To raise soil pH, ground limestone shall be used.

2.4.1.2 Hydrated Lime

Hydrated lime shall contain a minimum calcium carbonate equivalent of 110 percent. Gradation: a minimum 100 percent shall pass through a No. 8 sieve and a minimum 97 percent shall pass through a No. 60 sieve.

2.4.1.3 Burnt Lime

Burnt lime shall contain a minimum calcium carbonate equivalent of 140 percent. Gradation: A minimum 95 percent shall pass through a No. 8 sieve and a minimum 35 percent shall pass through a No. 60 sieve.

2.4.2 Fertilizer

The nutrients ratio for initial seedings shall be 16 percent nitrogen, 25 percent phosphorus, and 12 percent potassium. Fertilizer shall be controlled release commercial grade, free flowing, uniform in composition, and consist of a nitrogen-phosphorus-potassium ratio. The fertilizer shall be derived from sulphur-coated urea, urea formaldehyde, plastic or polymer coated pills, or isobutylenediurea. Fertilizer shall be balanced with the inclusion of trace minerals and micronutrients.

2.4.3 Organic Material

Organic material shall consist of bonemeal, rotted manure, decomposed wood derivatives, recycled compost, or worm castings.

2.4.3.1 Bonemeal

Bonemeal shall be finely ground, steamed bone product containing from 2 to 4 percent nitrogen and 16 to 40 percent phosphoric acid.

2.4.3.2 Rotted Manure

Rotted manure shall be unleached horse, chicken, or cattle manure containing a maximum 25 percent by volume of straw, sawdust, or other bedding materials. It shall contain no chemicals or ingredients harmful to plants. The manure shall be heat treated to kill weed seeds and be free of stones, sticks, and soil.

2.4.3.3 Decomposed Wood Derivatives

Decomposed wood derivatives shall be ground bark, sawdust, yard trimmings, or other wood waste material that is free of stones, sticks, soil, and toxic substances harmful to plants, and is fully composted or stabilized with nitrogen.

2.4.3.4 Recycled Compost

Compost shall be a well-decomposed, stable, weed free organic matter source. Compost shall be derived from food; agricultural or industrial residuals; biosolids (treated sewage sludge); yard trimmings; or source-separated or mixed solid waste. The compost shall possess no objectionable odors and shall not resemble the raw material from which it was derived. The material shall not contain substances toxic to plants. Gradation: The compost material shall pass through a 3/8-inch screen, possess a pH of 5.5 to 8.0, and have a moisture content between 35 and 55 percent by weight. The material shall not contain more than 1 percent by weight of man-made foreign matter. Compost shall be cleaned of plastic materials larger than 2 inches in length.

2.4.3.5 Worm Castings

Worm castings shall be screened from worms and food source, and shall be commercially packaged.

2.5 MULCH

Mulch shall be free from weeds (including, but not limited to, Johnson Grass, sericea Lespedeza, etc.), mold, and other deleterious materials. Mulch materials shall be native to the region.

2.5.1 Straw

Straw shall be stalks from oats, wheat, rye, barley, or rice, furnished in air-dry condition and with a consistency for placing with commercial mulch-blowing equipment.

2.5.2 Hay

Hay shall be native hay, sudan-grass hay, broomsedge hay, or other herbaceous mowings, furnished in an air-dry condition suitable for placing with commercial mulch-blowing equipment.

2.5.3 Wood Cellulose Fiber

Wood cellulose fiber shall not contain any growth or germination-inhibiting factors and shall be dyed an appropriate color to facilitate placement during application. Composition on air-dry weight basis: 9 to 15 percent moisture, pH range from 4.5 to 6.0.

2.5.4 Paper Fiber

Paper fiber mulch shall be recycled newsprint that is shredded for the purpose of mulching seed. Other commercial grade paper fiber may be used with the COR and/or the PO’s approval.

2.6 WATER

Water for seeding and irrigation purposes shall be the responsibility of the Contractor.

2.7 SURFACE EROSION CONTROL MATERIAL

Surface erosion control material shall conform to the following:

2.7.1 Erosion Control Blanket

2.7.1.1 Erosion Control Blanket shall be placed on all restored slopes greater than 3H:1V and (3-horizontal to 1-vertical).

2.7.1.2 Erosion control blanket shall be machine produced mat of wood excelsior formed from a web of interlocking wood fibers; covered on one side with either knitted straw blanket-like mat construction; covered with biodegradable plastic mesh; or interwoven biodegradable thread, plastic netting, or twisted kraft paper cord netting.

2.7.1.3 Erosion Control Blanket Anchors - Erosion control anchors shall be as recommended by the manufacturer.

2.7.2 Surface Erosion Control Fabric

Fabric shall be knitted construction of polypropylene yarn with uniform mesh openings 3/4 to 1 inch square with strips of biodegradable paper. Filler paper strips shall have a minimum life of 6 months.

2.7.3 Surface Erosion Control Net

Net shall be heavy, twisted jute mesh, weighing approximately 1.22 pounds per linear yard and 4 feet wide with mesh openings of approximately 1 inch square.

2.7.4 Hydrophilic Colloids

Hydrophilic colloids shall be physiologically harmless to plant and animal life without phytotoxic agents. Colloids shall be naturally occurring; silicate powder based, and shall form a water insoluble membrane after curing. Colloids shall resist mold growth.

Erosion control anchors shall be as recommended by the manufacturer.

PART 3 – EXECUTION

3.1 SEED TIME AND CONDITIONS

3.1.1 Seeding Time

Permanent seeding shall be done from April to October. Temporary seeding shall be performed as needed for soil stabilization. Seed for grass-lined channels shall be installed in March, April, August, or September.

3.1.2 Seeding Conditions

Seeding operations shall be performed only during periods when beneficial results can be obtained. When drought, excessive moisture, or other unsatisfactory conditions prevail, the work shall be

stopped when directed. When special conditions warrant a variance to the seeding operations, proposed alternate times shall be submitted to the COR and/or the PO for approval.

Temporary diversion of surface water may be required during seeding of grass-lined channels.

3.1.3 Soil Test

Topsoil shall be tested for pH and organic matter content to determine the quantities and type of soil amendments required to meet local growing conditions for the seed species specified. The samples shall be submitted to the Cherokee County Extension Service for analysis and amendment rates.

3.2 SITE PREPARATION

3.2.1 Finished Grade and Topsoil

The Contractor shall verify that finished grades are within the tolerances indicated on Contract Drawings prior to the commencement of the seeding operation.

3.2.2 Application of Soil Amendments

3.2.2.1 Lime

Lime shall be applied as recommended by the soil test. The lime shall be incorporated into the soil to a maximum 6-inch depth or may be incorporated as part of the tillage operation.

3.2.2.2 Fertilizer

The fertilizer shall be applied as recommended by the soil test. Fertilizer shall be incorporated into the soil to a maximum 6-inch depth or may be incorporated as part of the tillage or hydroseeding operation.

3.2.2.3 Organic Material

Organic materials shall be applied as recommended by the soil test. Organic materials shall be incorporated into the soil to a maximum depth of 6 inches as part of the tillage operation.

3.2.3 Tillage

Soil on slopes up to a maximum 3H:1V shall be tilled to a minimum 4-inch depth. On slopes between 3H:1V and 1H:1V, the soil shall be tilled to a minimum 2-inch depth by scarifying with heavy rakes, or other method. Rototillers shall be used where soil conditions and length of slope permit. On slopes 1H:1V and steeper, no tillage is required. Drainage patterns shall be maintained as indicated on drawings. Areas compacted by construction operations shall be completely pulverized by tillage. Soil used for repair of surface erosion or grade deficiencies shall conform to topsoil requirements. Lime and organic material shall be applied during this procedure.

3.2.4 Surface Preparation

The prepared surface shall be a maximum 1 inch below the adjoining grade of any surfaced area. New surfaces shall be blended to existing areas. Areas with the prepared surface shall be protected from compaction or damage by vehicular or pedestrian traffic and surface erosion.

3.3 SEEDING

Prior to seeding, any previously prepared surface compacted or damaged by precipitation, erosion, or human activity shall be reworked to meet the requirements of Paragraph 3.2. Seeding operations shall not take place when the wind velocity will prevent uniform seed distribution.

3.3.1 Seeding Methods

Seeding methods used by the Contractor must ultimately achieve a stand of grass that meets the requirements specified in Paragraph 3.11, and could include hydroseeding, broadcast seeding, drill seeding and/or other methods.

3.3.2 Hydroseeding

Seed and fertilizer shall be added to water and thoroughly mixed to meet the rates specified. The time period for the seed to be held in the slurry shall be a maximum 24 hours. Wood cellulose fiber mulch and tackifier, if used, shall be added at the rates recommended by the manufacturer after the seed, fertilizer, and water have been thoroughly mixed to produce a homogeneous slurry. Slurry shall be uniformly applied under pressure over the entire area. The hydroseeded area shall not be rolled.

3.3.3 Mulching

3.3.3.1 Hay or Straw Mulch

Hay or straw mulch shall be spread uniformly at the rate of 2 tons per acre. Mulch shall be spread by hand, blower-type mulch spreader, or other approved method. Mulching shall be started on the windward side of relatively flat areas or on the upper part of steep slopes, and continued uniformly until the area is covered. The mulch shall not be bunched or clumped. Sunlight shall not be completely excluded from penetrating to the ground surface. All areas installed with seed shall be mulched on the same day as the seeding. Mulch shall be anchored immediately following spreading using mechanical means (3.3.3.2) or chemical means (3.3.3.3).

3.3.3.2 Mechanical Anchor

Mechanical anchor shall be a V-type-wheel land packer; a scalloped-disk land packer designed to force mulch into the soil surface by crimping or punching; or other suitable equipment.

3.3.3.3 Non-Asphaltic Tackifier

Hydrophilic colloid shall be applied at the rate recommended by the manufacturer, using hydraulic equipment suitable for thoroughly mixing with water. A uniform mixture shall be applied over the area.

3.3.3.4 Wood Cellulose Fiber, Paper Fiber, and Recycled Paper

Wood cellulose fiber, paper fiber, or recycled paper shall be applied as part of the hydroseeding operation. The mulch shall be mixed and applied in accordance with the manufacturer's recommendations.

3.4 WATERING

Watering shall be started immediately after completing the seeding of an area. Water shall be applied to supplement rainfall at a rate sufficient to ensure moist soil conditions to a minimum 1 inch depth. Run-off and puddling shall be prevented. Watering trucks shall not be driven over turf areas, unless otherwise approved by the COR and/or the PO. Watering of other adjacent areas or plant material shall be prevented.

3.5 SURFACE EROSION CONTROL

3.5.1 Surface Erosion Control Material

Placement of the material shall be accomplished without damage to installed material or without deviation to finished grade. The use of surface erosion control material shall be at the discretion of the Contractor. Surface erosion control material shall meet the requirements of SECTION 02910 – EROSION AND SEDIMENT CONTROL and this Specification Section.

3.5.2 Erosion Control Material Placement

3.5.2.1 Before placing the erosion control material placement, ensure the subgrade has been graded smooth; has no depressed, void areas; is free from obstructions, such as tree roots, projecting stones or other foreign matter. Vehicles shall not be permitted directly on the surface control material placement.

3.5.2.2 Erosion control material shall be oriented in vertical strips and anchored using materials specified in Paragraph 2.7 herein. Adjacent strips shall be abutted to allow for installation of a common row of anchors. Horizontal joints between erosion control blankets shall be overlapped sufficiently to accommodate a common row of anchors with the uphill end on top.

3.5.2.3 Where exposed to overland sheet flow, a trench shall be located at the uphill termination. The erosion control material shall be anchored to the bottom of the trench. Backfill and compact the trench as required.

3.5.3 Temporary Seeding

The application rate of temporary seed is specified in Table 02921-2.

3.5.3.1 Soil Amendments

When soil amendments have not been applied to the area, half the quantity of the required soil amendments shall be applied and the area tilled in accordance with Paragraph 3.2. The area shall be watered in accordance with Paragraph 3.4.

3.6 RESTORATION AND CLEAN UP

3.6.1 Restoration

Existing turf areas, pavements, and facilities that have been damaged from the seeding operation shall be restored to original condition at Contractor's expense.

3.6.2 Clean Up

Excess and waste material shall be removed from the seeded areas and shall be disposed off site. Adjacent paved areas shall be cleaned.

3.7 PROTECTION OF INSTALLED AREAS

Immediately upon completion of the seeding operation in an area, the area shall be protected against traffic or other use by erecting barricades and providing signage as needed.

3.8 SEED ESTABLISHMENT AND MAINTENANCE

3.8.1 Commencement

The seed establishment period to obtain a healthy stand of grass plants shall end 3 months after the last day of the seeding operation.

3.8.2 Maintenance During Establishment Period

Maintenance of the seeded areas shall include protecting embankments and ditches from surface erosion; maintaining erosion control materials and mulch; protecting installed areas from traffic; and watering.

3.8.2.1 Repair or Reinstall

The Contractor is responsible for establishing an even stand of grass. Unsatisfactory stand of grass plants and mulch shall be repaired or reinstalled, and eroded areas shall be repaired in accordance with Paragraph 3.2 as soon as seeding conditions permit.

3.8.2.2 Mowing

The Contractor is responsible for mowing vegetation until the end of the contract period, as specified herein.

The Contractor shall check with the local Agriculture County Extension Service for recommended mowing heights for the seed specifies mixtures to be planted under this specification. Mowing height for the vegetation shall be based on these recommendations, and shall be performed in a manner that prevents scalping, rutting, bruising, uneven and rough cutting. Prior to mowing, all rubbish, debris, trash, leaves, rocks, paper, and limbs or branches on area to be mowed shall be picked up and disposed. Mowing shall be performed three times per growing season.

3.9 PROTECTION OF INSTALLED AREAS

3.9.1 Immediately upon completion of the seeding operation in an area, protect the area against traffic or other use by erecting barricades and providing signage as needed.

3.9.2 It shall be the Contractor's responsibility to provide satisfactory growth and coverage of the specified species. Growth and coverage on areas seeded as specified shall be considered to be in reasonably close conformity with the intent of the Contract when the vegetation has reached a point of maturity such that each area shows satisfactory visible growth with no bare spots larger than 9 square inches. Bare spots shall be scattered and the total bare areas shall not comprise more than 1/100 of any given area.

3.10 MAINTENANCE RECORD

Record each site visit, describing the maintenance work performed, areas repaired or reinstalled, and diagnosis for unsatisfactory stands of grass and plant materials.

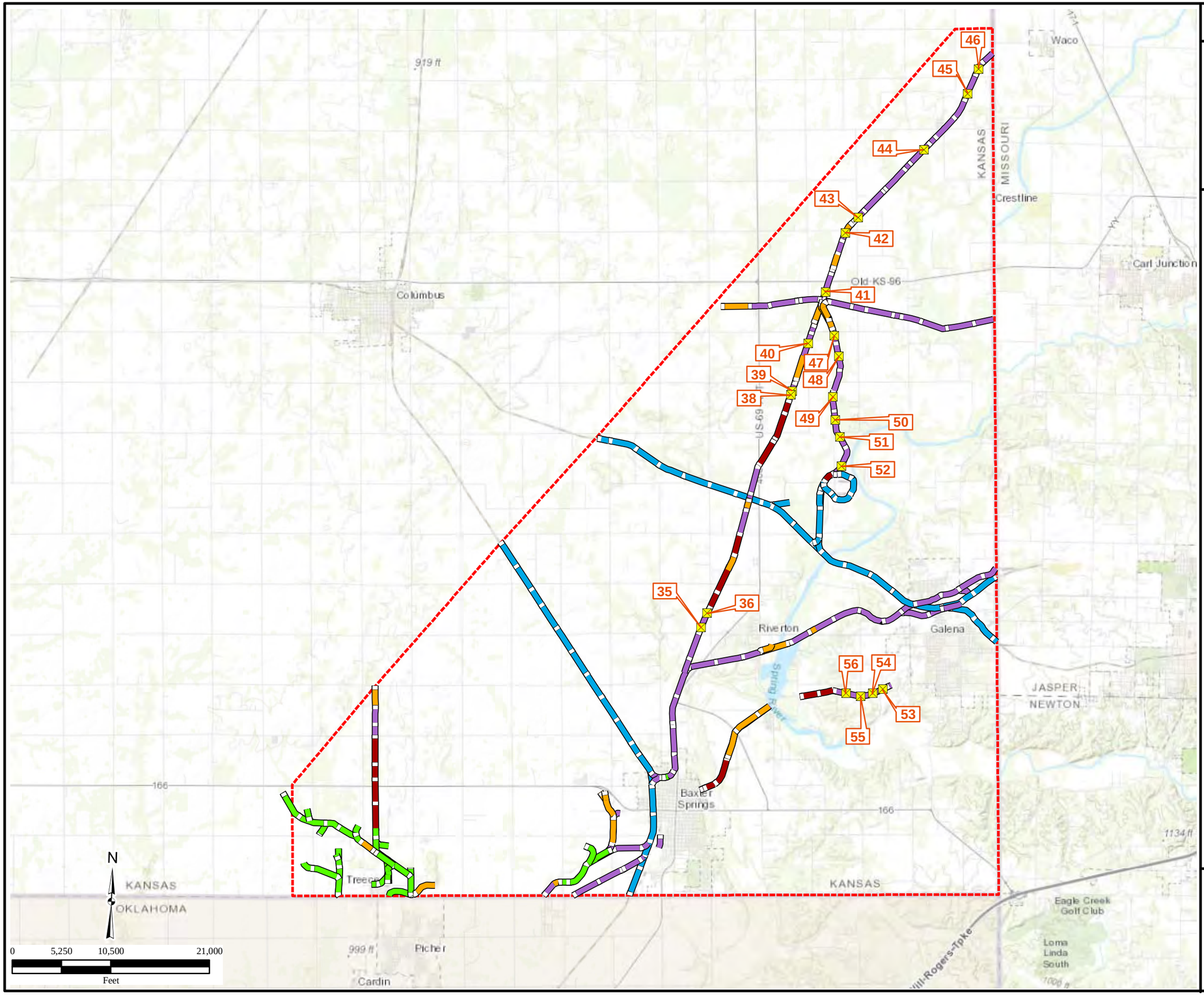
3.11 FINAL INSPECTION AND ACCEPTANCE

A satisfactory stand is defined as a cover of living plants, after true leaves are formed, of the required seed species designated for use in which gaps larger than 9 square inches do not occur. A final inspection shall be held by the Representative to determine that deficiencies noted in the preliminary inspections have been corrected. Time for the inspection shall be established in writing.

END OF SECTION

ATTACHMENT 6
DATA GAP SAMPLE RESULTS
(Provided on CD)

Figure 4.1
Former Rail Line Classifications and Sample Locations



Legend

- RD Sample Location
- 35 — RD Sample Identification
- Site Boundary

Rail Classification

- Active Line
- Former Lines Within OU8
- No Longer Present or Remediated
- Addressed Under Other OU
- No Access

Notes:
Rail lines addressed under other OUs were remediated to cleanup levels established for those OUs.

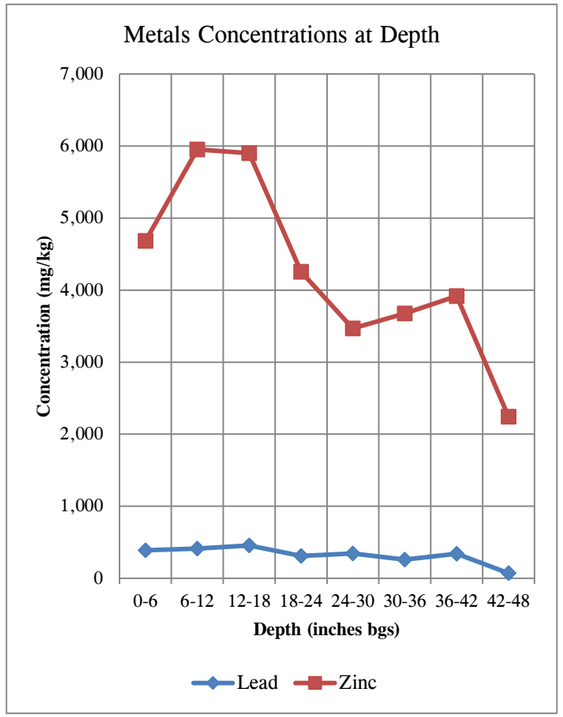
OU=operable unit
RD=remedial design
RI=remedial investigation
SMP=sampling and analysis plan

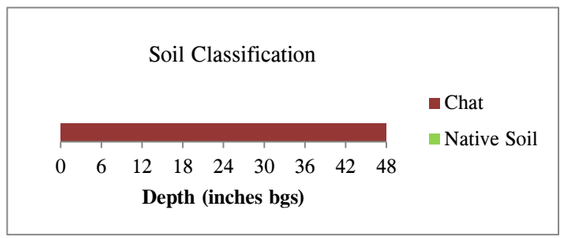
\\Gst-srv-01\HGLGIS\Cherokee_County_MSIW\SAP
(4-01)RR_Class_Sample_Locs.mxd
2/7/2018 JG
Source: HGL,
ArcGIS Online USA Topo Map

HGL HydroGeoLogic, Inc.

Figure RD.1
Metals Concentrations at Depth - Locations 35 and 36
Field Screening Data
Cherokee County Site - OU8 Railroads
Cherokee County, Kansas

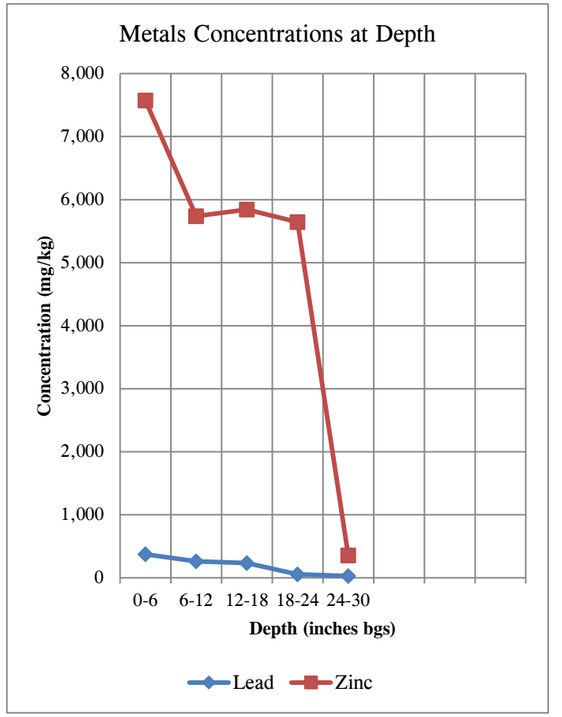
35

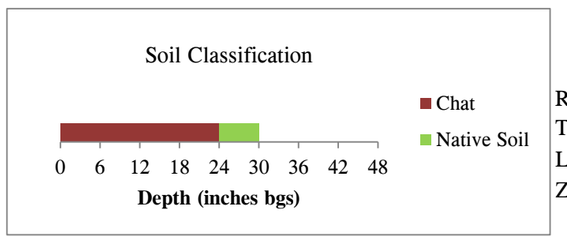




Depth (inches bgs)	Metal Concentrations	
	Lead	Zinc
0-6	**389**	**4,684**
6-12	**412**	**5,952**
12-18	**456**	**5,901**
18-24	**310**	**4,256**
24-30	**343**	**3,468**
30-36	**258**	**3,675**
36-42	**342**	**3,919**
42-48	**70**	**2,242**

36





Depth (inches bgs)	Metal Concentrations	
	Lead	Zinc
0-6	**374**	**7,574**
6-12	**261**	**5,738**
12-18	**237**	**5,844**
18-24	**55**	**5,645**
24-30	**29**	**354**

Test Pit 36-E

Depth (inches bgs)	Metal Concentrations	
	Lead	Zinc
0-6	**113**	**1,983**

Test Pit 36-W

Depth (inches bgs)	Metal Concentrations	
	Lead	Zinc
0-6	**80**	**1,167**

Residential Soil Regional Screening Levels
Total Hazard Quotient = 0.1 (June 2015)
Lead - 1,770 mg/kg
Zinc - 4,000 mg/kg

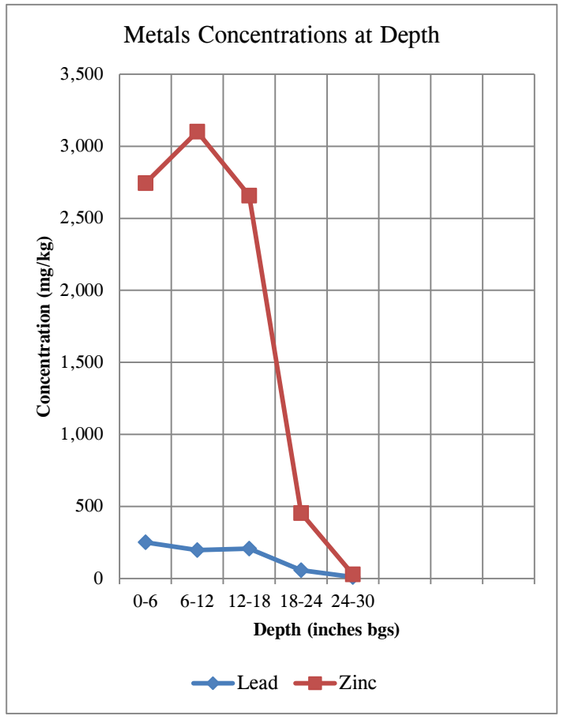
[ ] - Above Regional Screening Level
bgs - below ground surface
mg/kg - milligrams per kilogram

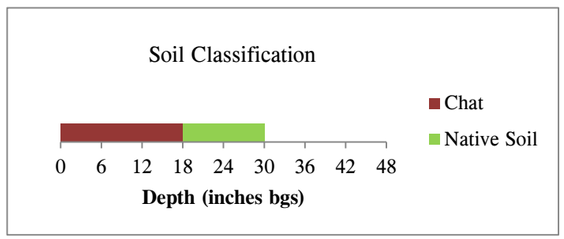
Bold - Detection
Non Bold - represents the method detection limit for samples not detected. Method detection limits were used because results could be up to or equal to the method detection limit without being detected and zero was not considered a correct representation.

All metals concentrations reported in mg/kg.

Figure RD.2
Metals Concentrations at Depth - Locations 38 & 39
Field Screening Data
Cherokee County Site - OU8 Railroads
Cherokee County, Kansas

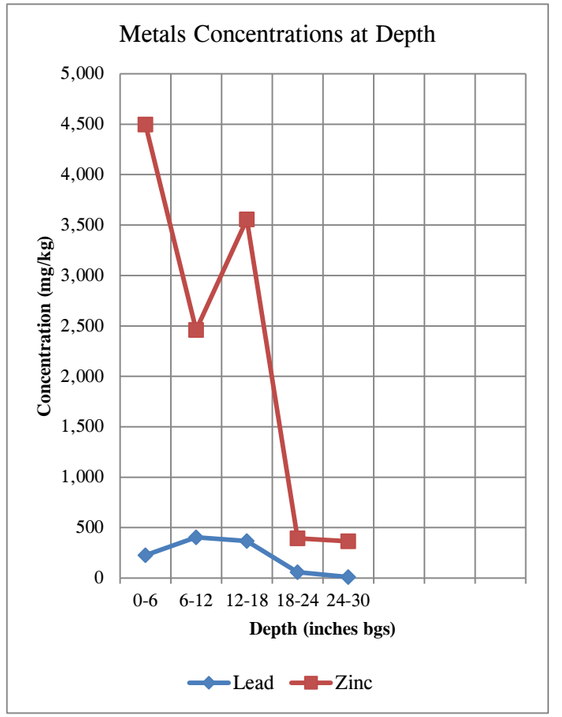
38

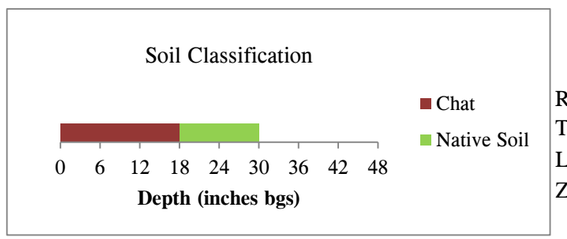




Depth (inches bgs)	Metal Concentrations	
	Lead	Zinc
0-6	**251**	**2,744**
6-12	**197**	**3,101**
12-18	**208**	**2,658**
18-24	**58**	**454**
24-30	**10**	**28**

39





Depth (inches bgs)	Metal Concentrations	
	Lead	Zinc
0-6	**227**	**4,498**
6-12	**404**	**2,461**
12-18	**367**	**3,556**
18-24	**58**	**393**
24-30	**10**	**365**

Test Pit 38-E

Depth (inches bgs)	Metal Concentrations	
	Lead	Zinc
0-6	**31**	**253**

Test Pit 38-W

Depth (inches bgs)	Metal Concentrations	
	Lead	Zinc
0-6	**19**	**115**

Residential Soil Regional Screening Levels
Total Hazard Quotient = 0.1 (June 2015)
Lead - 1,770 mg/kg
Zinc - 4,000 mg/kg

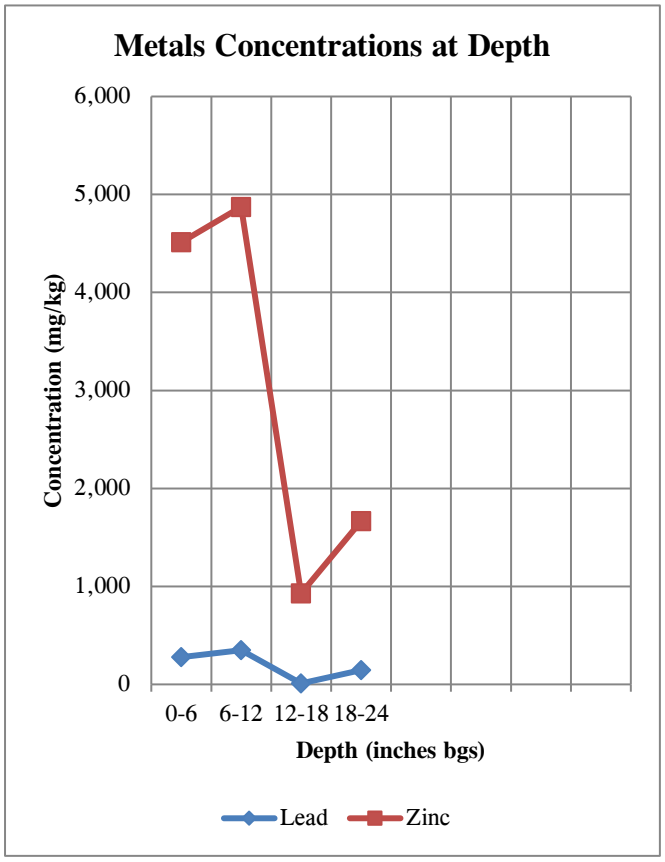
- Above Regional Screening Level
bgs - below ground surface
mg/kg - milligrams per kilogram

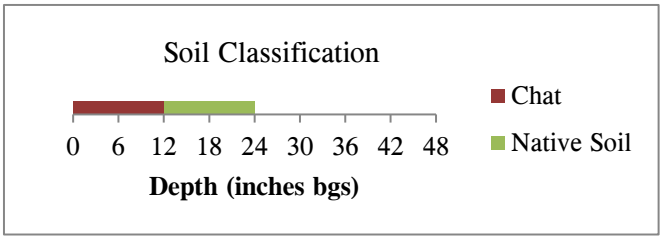
Bold - Detection
Non Bold - represents the method detection limit for samples not detected. Method detection limits were used because results could be up to or equal to the method detection limit without being detected and zero was not considered a correct representation.

All metals concentrations reported in mg/kg.

Figure RD.3
Metals Concentrations at Depth - Location 40
Field Screening Data
Cherokee County Site - OU8 Railroads, Cherokee County, Kansas

40





Depth (inches bgs)	Metal Concentrations	
	Lead	Zinc
0-6	**279**	**4,513**
6-12	**349**	**4,873**
12-18	**10**	**928**
18-24	**145**	**1,667**

Residential Soil Regional Screening Levels
Total Hazard Quotient = 0.1 (June 2015)
Lead - 1,770 mg/kg
Zinc - 4,000 mg/kg

- Above Regional Screening Level

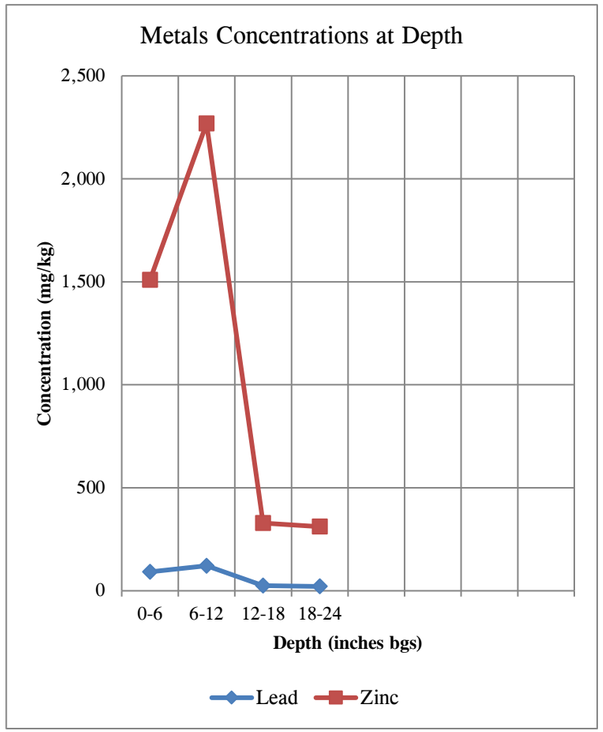
bgs - below ground surface
mg/kg - milligrams per kilogram

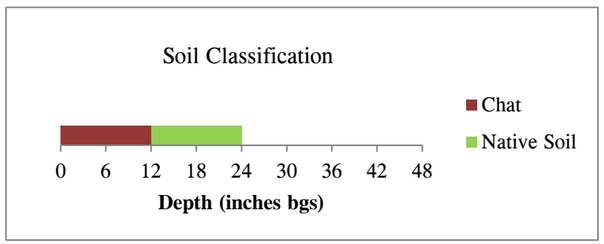
Bold - Detection
Non Bold - represents the method detection limit for samples not detected. Method detection limits were used because results could be up to or equal to the method detection limit without being detected and zero was not considered a correct representation.

All metals concentrations reported in mg/kg.

Figure RD.4
Metals Concentrations at Depth - Location 41-43
Field Screening Data
Cherokee County Site - OU8 Railroads
Cherokee County, Kansas

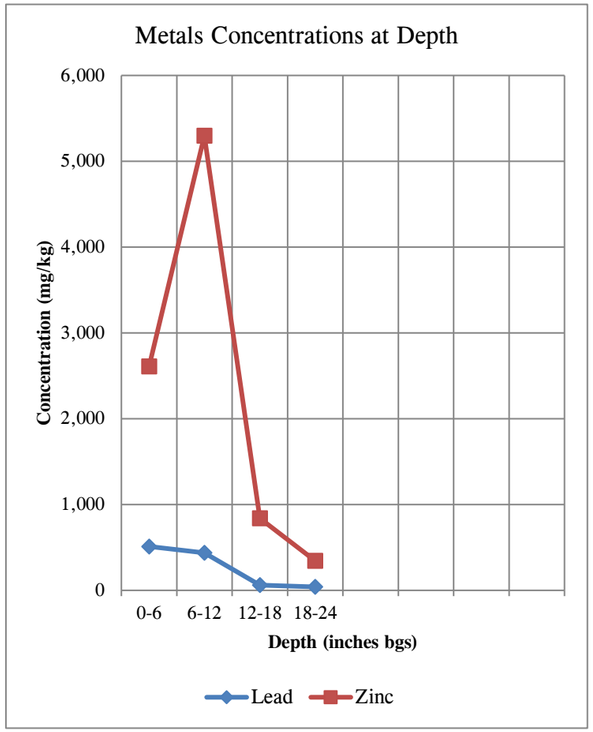
41

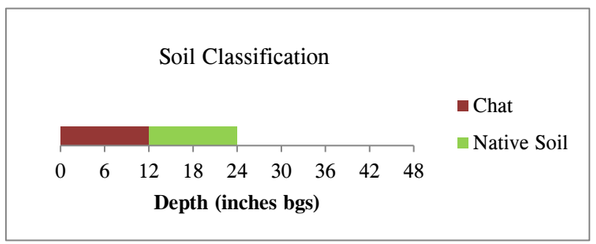




Depth (inches bgs)	Metal Concentrations	
	Lead	Zinc
0-6	**92**	**1,509**
6-12	**122**	**2,268**
12-18	**25**	**329**
18-24	**21**	**311**

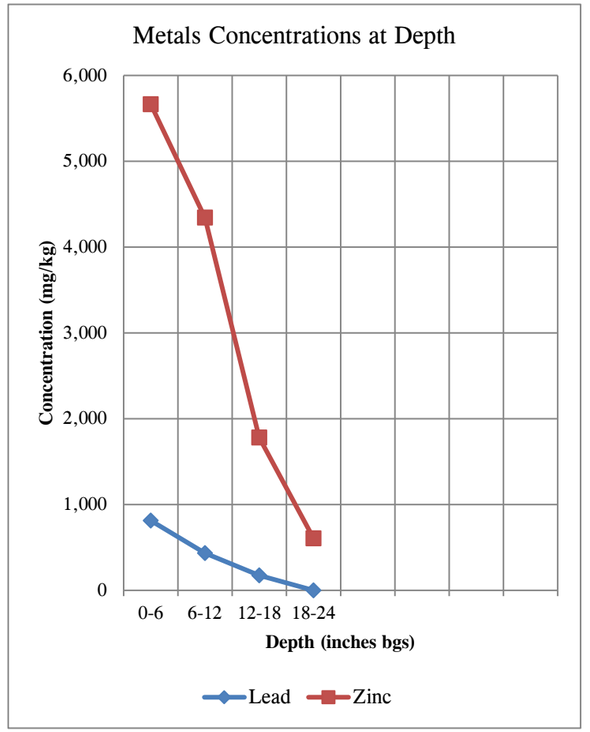
42

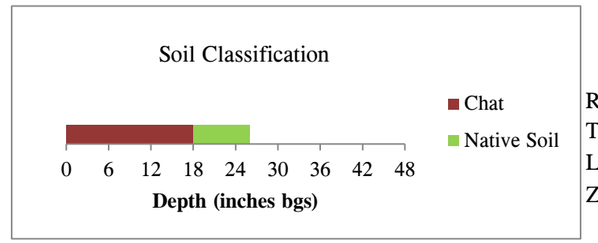




Depth (inches bgs)	Metal Concentrations	
	Lead	Zinc
0-6	**511**	**2,610**
6-12	**438**	**5,296**
12-18	**62**	**838**
18-24	**40**	**344**

43





Depth (inches bgs)	Metal Concentrations	
	Lead	Zinc
0-6	**813**	**5,664**
6-12	**433**	**4,343**
12-18	**174**	**1,781**
18-24	<27	**607**

Test Pit 43-E

Depth (inches bgs)	Metal Concentrations	
	Lead	Zinc
0-6	**86**	**685**

Test Pit 43-W

Depth (inches bgs)	Metal Concentrations	
	Lead	Zinc
0-6	**272**	**904**

Residential Soil Regional Screening Levels
Total Hazard Quotient = 0.1 (June 2015)
Lead - 1,770 mg/kg
Zinc - 4,000 mg/kg

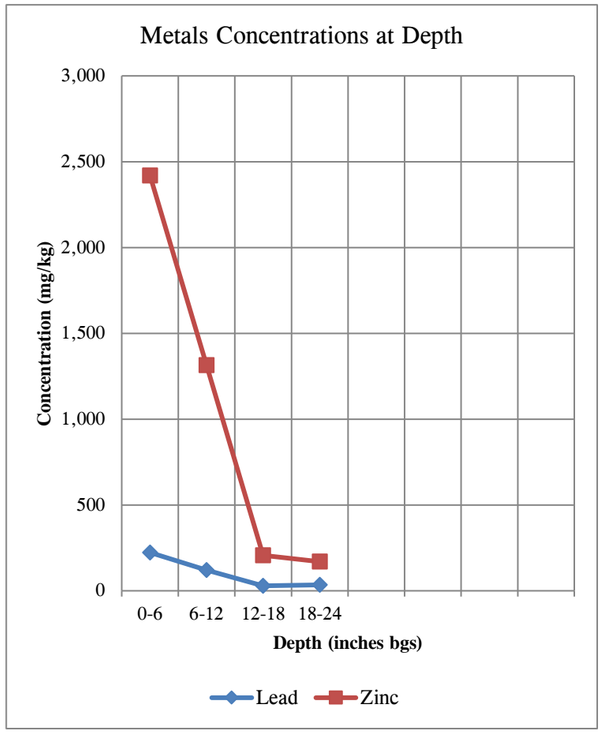
- Above Residential Screening Level

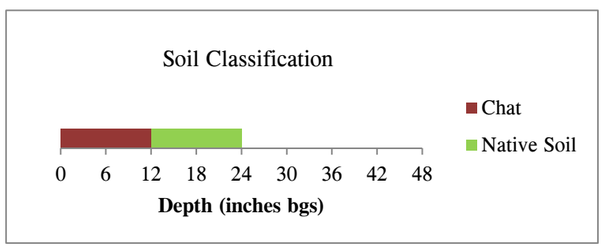
bgs - below ground surface
mg/kg - milligrams per kilogram
Bold - Detection
Non Bold - represents the method detection limit for samples not detected. Method detection limits were used because results could be up to or equal to the method detection limit without being detected and zero was not considered a correct representation.

All metals concentrations reorted in mg/kg.

Figure RD.5
Metals Concentrations at Depth - Location 44-46
Field Screening Data
Cherokee County Site - OU8 Railroads
Cherokee County, Kansas

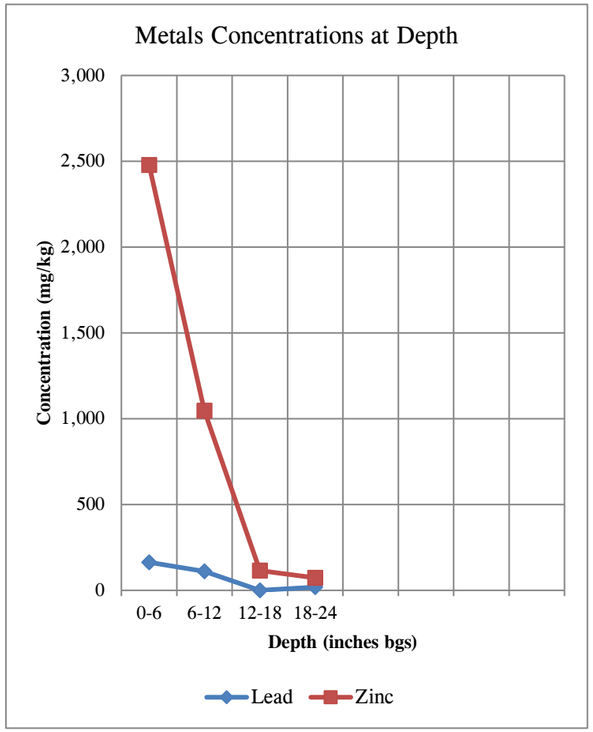
44

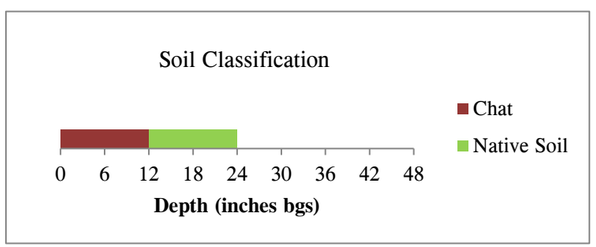




Depth (inches bgs)	Metal Concentrations	
	Lead	Zinc
0-6	**223**	**2,419**
6-12	**120**	**1,314**
12-18	**29**	**207**
18-24	**35**	**170**

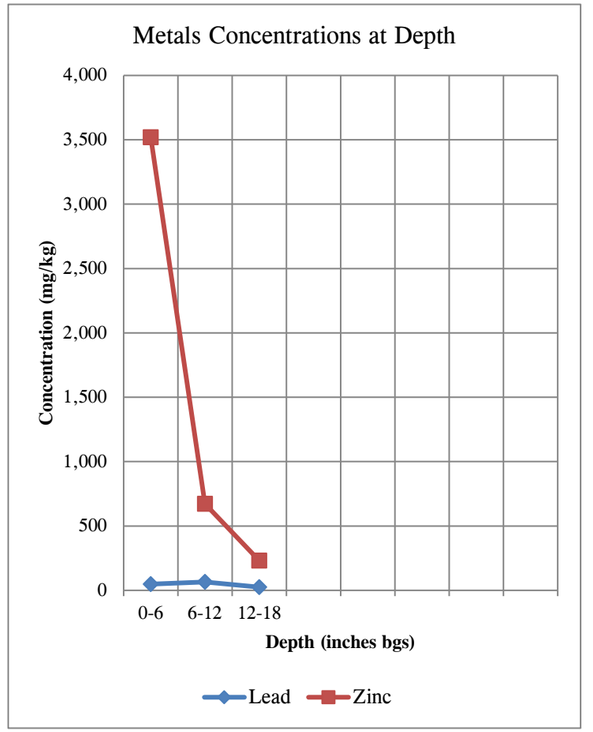
45

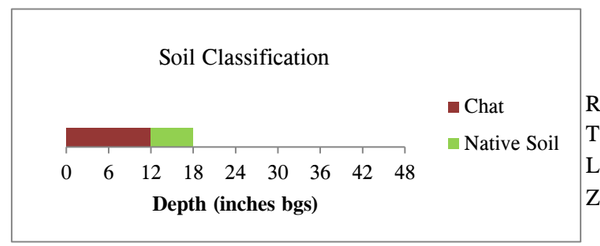




Depth (inches bgs)	Metal Concentrations	
	Lead	Zinc
0-6	**163**	**2,479**
6-12	**111**	**1,046**
12-18	< 16.3	**116**
18-24	**19**	**73**

46





Depth (inches bgs)	Metal Concentrations	
	Lead	Zinc
0-6	**48**	**3,519**
6-12	**65**	**673**
12-18	**25**	**231**

Test Pit 46-E

Depth (inches bgs)	Metal Concentrations	
	Lead	Zinc
0-6	**182**	**2,423**

Test Pit 46-W

Depth (inches bgs)	Metal Concentrations	
	Lead	Zinc
0-6	**325**	**3,654**

Residential Soil Regional Screening Levels
Total Hazard Quotient = 0.1 (June 2015)
Lead - 1,770 mg/kg
Zinc - 4,000 mg/kg

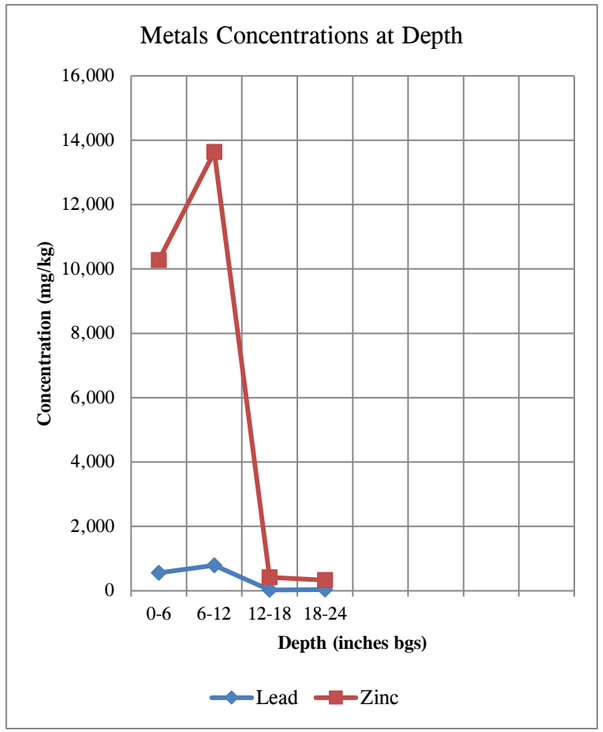
- Above Residential Screening Level

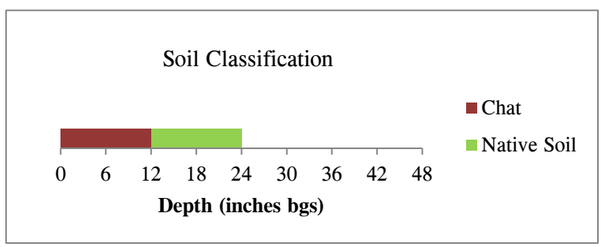
bgs - below ground surface
mg/kg - milligrams per kilogram
Bold - Detection
Non Bold - represents the method detection limit for samples not detected. Method detection limits were used because results could be up to or equal to the method detection limit without being detected and zero was not considered a correct representation.

All metals concentrations reorted in mg/kg.

Figure RD.6
Metals Concentrations at Depth - Location 47, 48 & 52
Field Screening Data
Cherokee County Site - OU8 Railroads
Cherokee County, Kansas

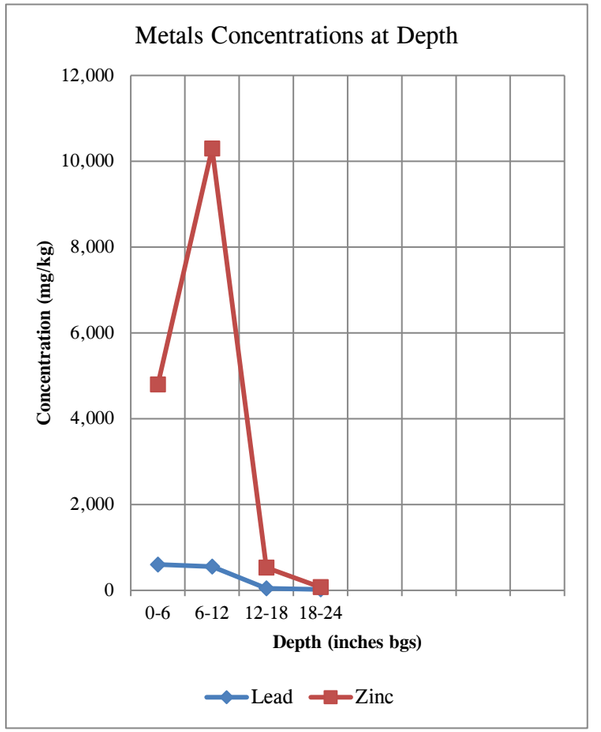
47

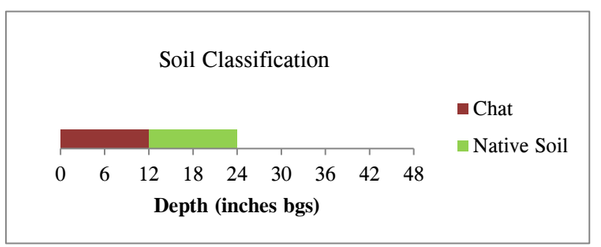




Depth (inches bgs)	Metal Concentrations	
	Lead	Zinc
0-6	**554**	**10,275**
6-12	**791**	**13,633**
12-18	**26**	**414**
18-24	**33**	**331**

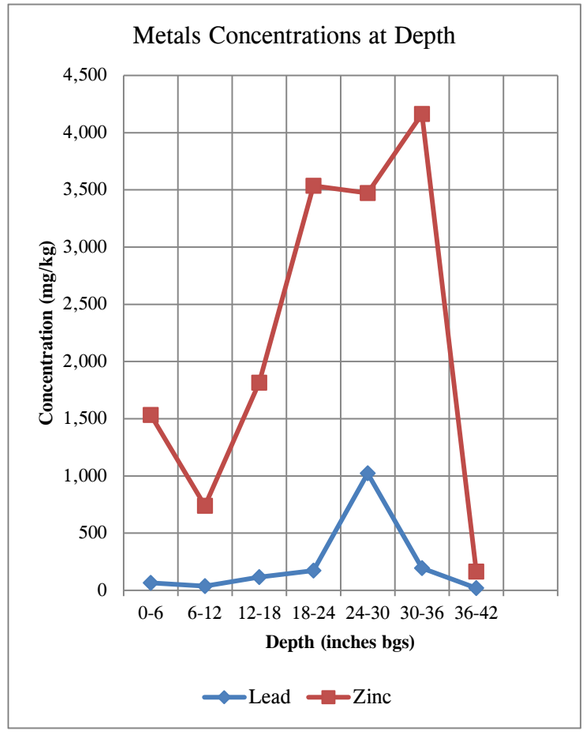
48

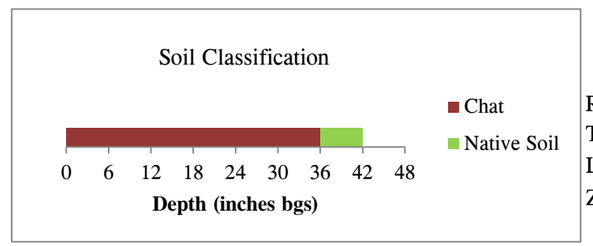




Depth (inches bgs)	Metal Concentrations	
	Lead	Zinc
0-6	**603**	**4,798**
6-12	**551**	**10,295**
12-18	**45**	**530**
18-24	**21**	**73**

52





Depth (inches bgs)	Metal Concentrations	
	Lead	Zinc
0-6	**66**	**1,533**
6-12	**37**	**739**
12-18	**115**	**1,815**
18-24	**173**	**3,535**
24-30	**1,022**	**3,471**
30-36	**195**	**4,163**
36-42	**20**	**164**

Test Pit 48-E

Depth (inches bgs)	Metal Concentrations	
	Lead	Zinc
0-6	**446**	**1,026**

Test Pit 48-W

Depth (inches bgs)	Metal Concentrations	
	Lead	Zinc
0-6	**38**	**131**

Residential Soil Regional Screening Levels
Total Hazard Quotient = 0.1 (June 2015)
Lead - 1,770 mg/kg
Zinc - 4,000 mg/kg

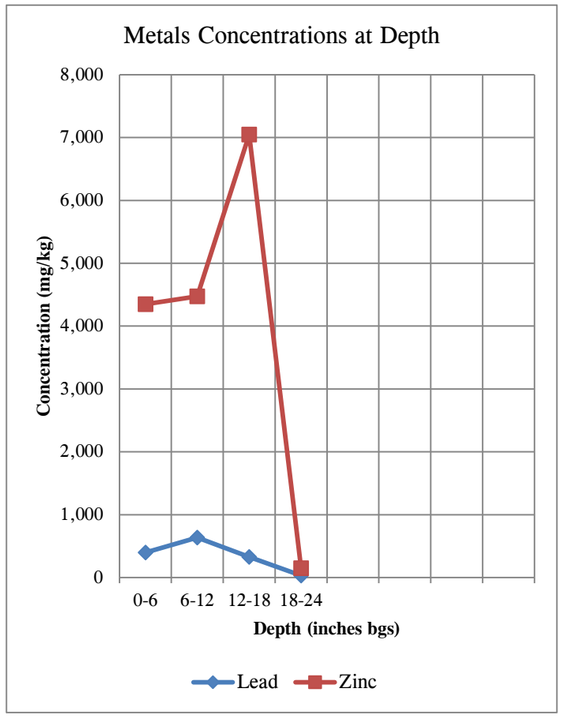
- Above Residential Screening Level

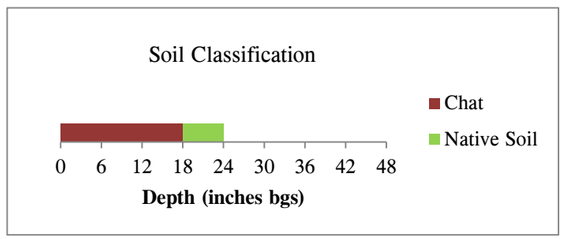
bgs - below ground surface
mg/kg - milligrams per kilogram
Bold - Detection
Non Bold - represents the method detection limit for samples not detected. Method detection limits were used because results could be up to or equal to the method detection limit without being detected and zero was not considered a correct representation.

All metals concentrations reorted in mg/kg.

Figure RD.7
Metals Concentrations at Depth - Locations 49 & 50
Field Screening Data
Cherokee County Site - OU8 Railroads
Cherokee County, Kansas

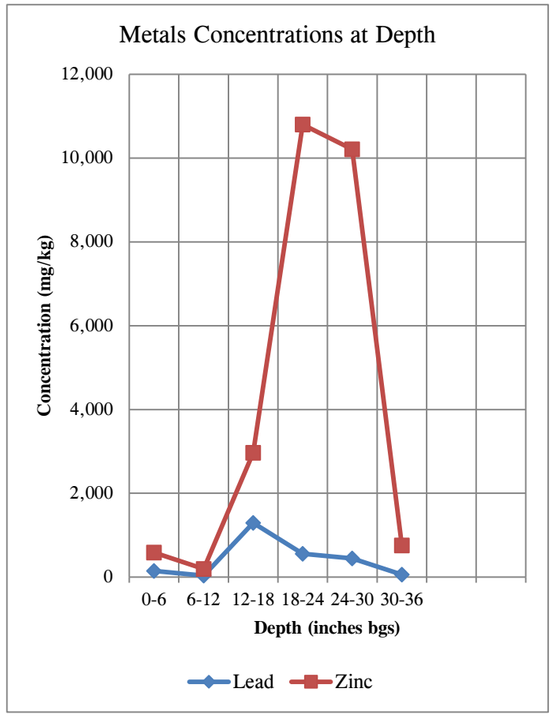
49

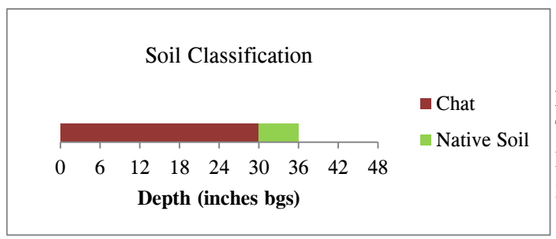




Depth (inches bgs)	Metal Concentrations	
	Lead	Zinc
0-6	**399**	**4,349**
6-12	**636**	**4,472**
12-18	**326**	**7,047**
18-24	**32**	**150**

50





Depth (inches bgs)	Metal Concentrations	
	Lead	**Zinc**
0-6	**147**	**588**
6-12	**35**	**195**
12-18	**1,294**	**2,968**
18-24	**555**	**10,800**
24-30	**444**	**10,210**
30-36	**60**	**754**

Residential Soil Regional Screening Levels
Total Hazard Quotient = 0.1 (June 2015)
Lead - 1,770 mg/kg
Zinc - 4,000 mg/kg

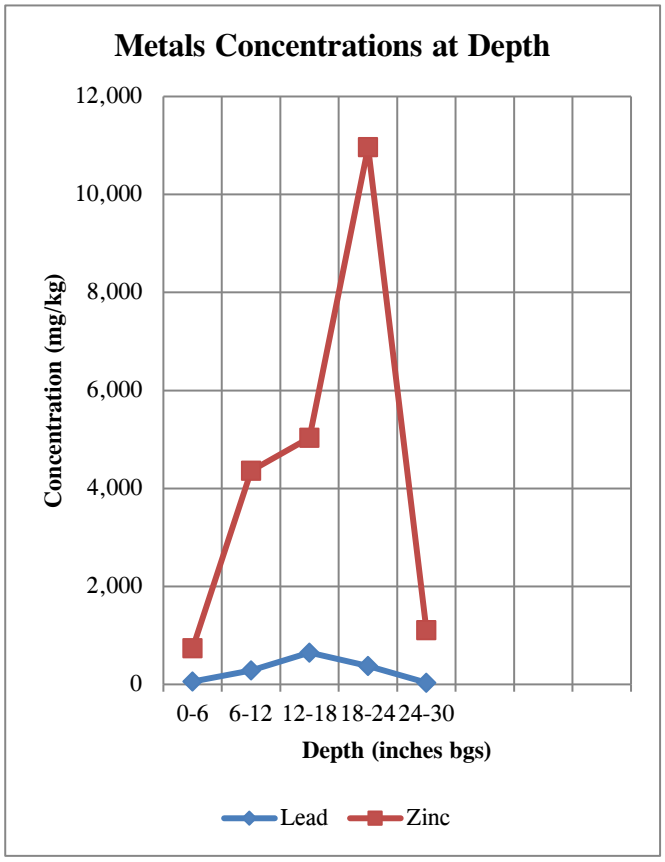
[ ] - Above Regional Screening Level
bgs - below ground surface
mg/kg - milligrams per kilogram

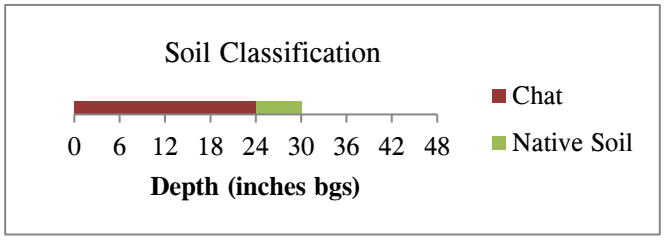
Bold - Detection
Non Bold - represents the method detection limit for samples not detected. Method detection limits were used because results could be up to or equal to the method detection limit without being detected and zero was not considered a correct representation.

All metals concentrations reported in mg/kg.

Figure RD.8
Metals Concentrations at Depth - Location 51
Field Screening Data
Cherokee County Site - OU8 Railroads, Cherokee County, Kansas

51





Test Pit 51-W

Depth (inches bgs)	Metal Concentrations	
	Lead	Zinc
0-6	**52**	**164**

Depth (inches bgs)	Metal Concentrations	
	Lead	Zinc
0-6	**56**	**735**
6-12	**282**	**4,363**
12-18	**649**	**5,031**
18-24	**378**	**10,964**
24-30	**35**	**1,105**

Residential Soil Regional Screening Levels
Total Hazard Quotient = 0.1 (June 2015)
Lead - 1,770 mg/kg
Zinc - 4,000 mg/kg
NS = Not sampled after native soil found

- Above Regional Screening Level

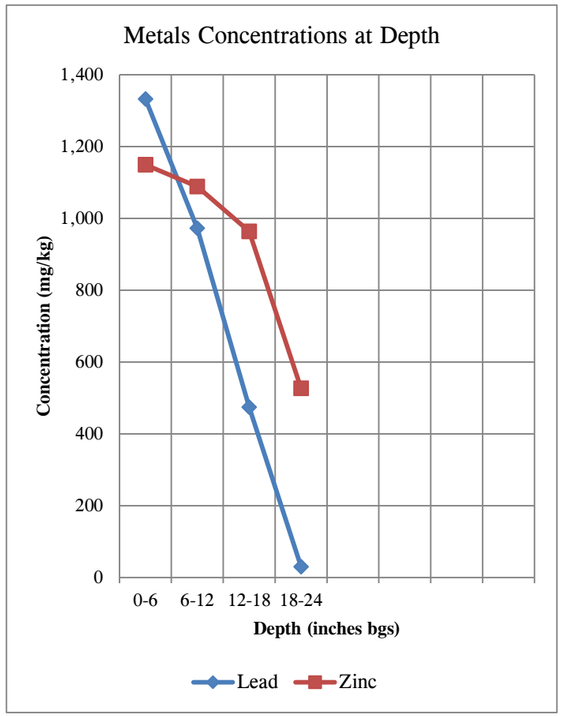
bgs - below ground surface
mg/kg - milligrams per kilogram

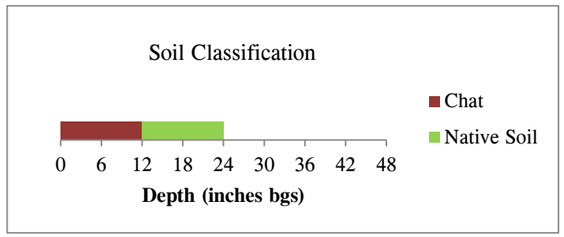
Bold - Detection
Non Bold - represents the method detection limit for samples not detected. Method detection limits were used because results could be up to or equal to the method detection limit without being detected and zero was not considered a correct representation.

All metals concentrations reported in mg/kg.

Figure RD.9
Metals Concentrations at Depth - Locations 53 & 54
Field Screening Data
Cherokee County Site - OU8 Railroads
Cherokee County, Kansas

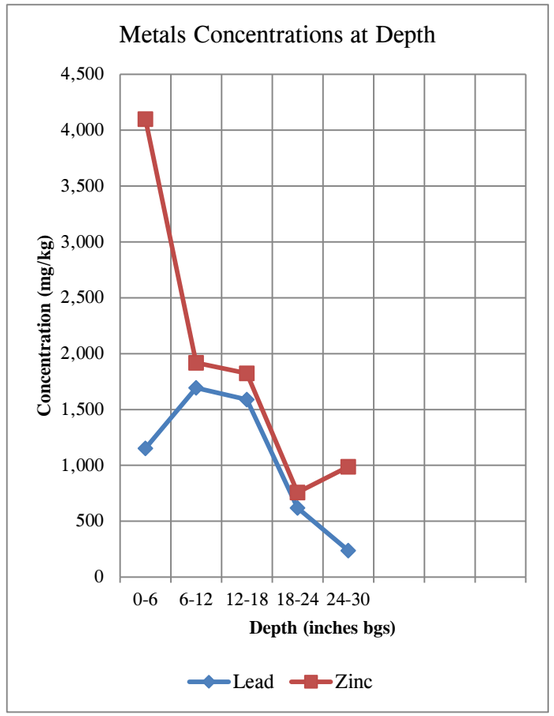
53

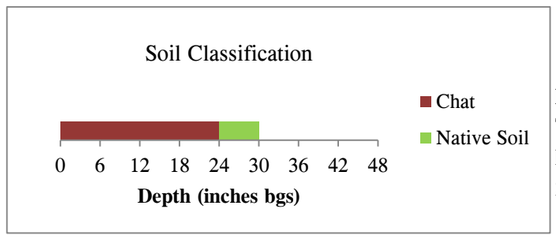




Depth (inches bgs)	Metal Concentrations	
	Lead	Zinc
0-6	**1,333**	**1,149**
6-12	**973**	**1,089**
12-18	**474**	**964**
18-24	**30**	**527**

54





Depth (inches bgs)	Metal Concentrations	
	Lead	**Zinc**
0-6	**1,153**	**4,099**
6-12	**1,693**	**1,918**
12-18	**1,589**	**1,824**
18-24	**619**	**757**
24-30	**238**	**988**

Residential Soil Regional Screening Levels
Total Hazard Quotient = 0.1 (June 2015)
Lead - 1,770 mg/kg
Zinc - 4,000 mg/kg

- Above Regional Screening Level

bgs - below ground surface
mg/kg - milligrams per kilogram

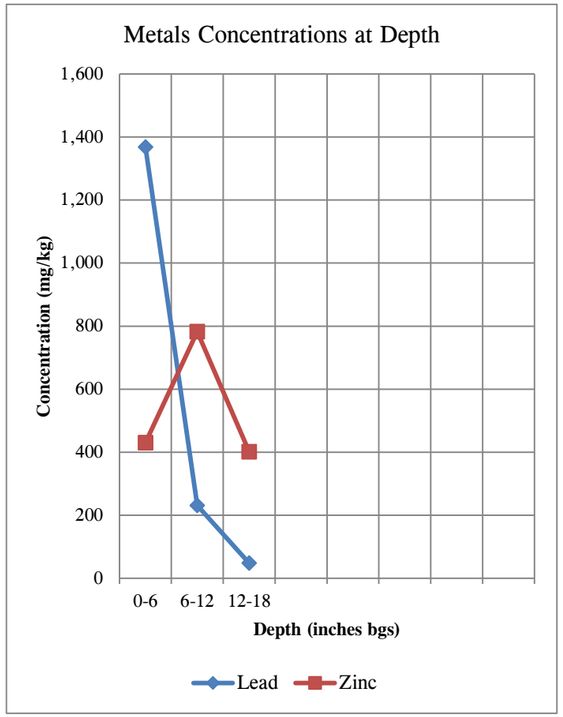
Bold - Detection

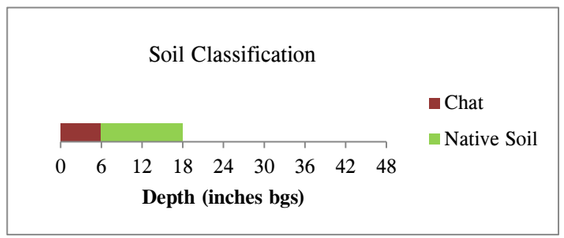
Non Bold - represents the method detection limit for samples not detected. Method detection limits were used because results could be up to or equal to the method detection limit without being detected and zero was not considered a correct representation.

All metals concentrations reported in mg/kg.

Figure RD.10
Metals Concentrations at Depth - Locations 55 & 56
Field Screening Data
Cherokee County Site - OU8 Railroads
Cherokee County, Kansas

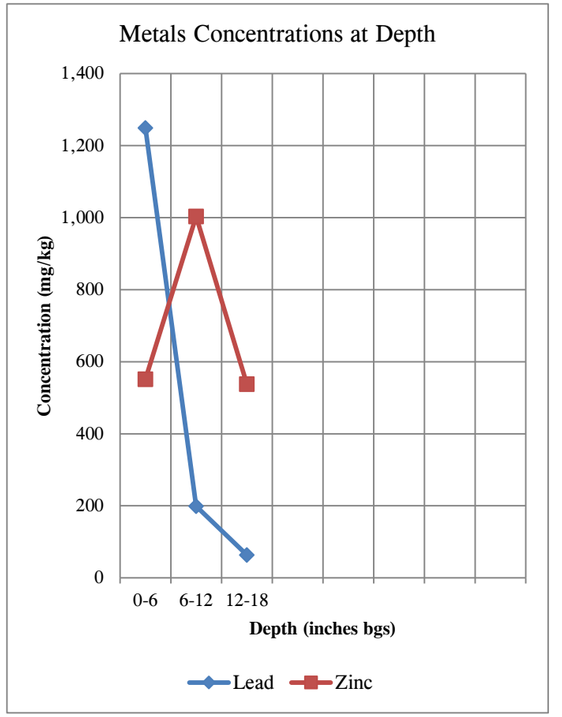
55

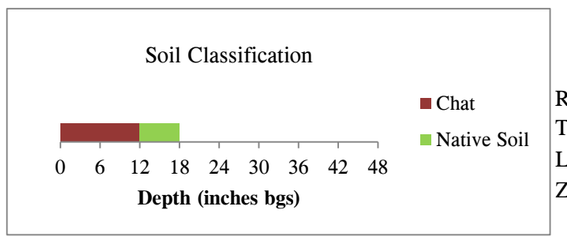




Depth (inches bgs)	Metal Concentrations	
	Lead	Zinc
0-6	**1,368**	**430**
6-12	**231**	**782**
12-18	**48**	**401**

56





Depth (inches bgs)	Metal Concentrations	
	Lead	Zinc
0-6	**1,249**	**551**
6-12	**199**	**1,004**
12-18	**64**	**538**

Test Pit 56-N

Depth (inches bgs)	Metal Concentrations	
	Lead	Zinc
0-6	**61**	**616**

Test Pit 56-S

Depth (inches bgs)	Metal Concentrations	
	Lead	Zinc
0-6	**418**	**407**

Residential Soil Regional Screening Levels
Total Hazard Quotient = 0.1 (June 2015)
Lead - 1,770 mg/kg
Zinc - 4,000 mg/kg

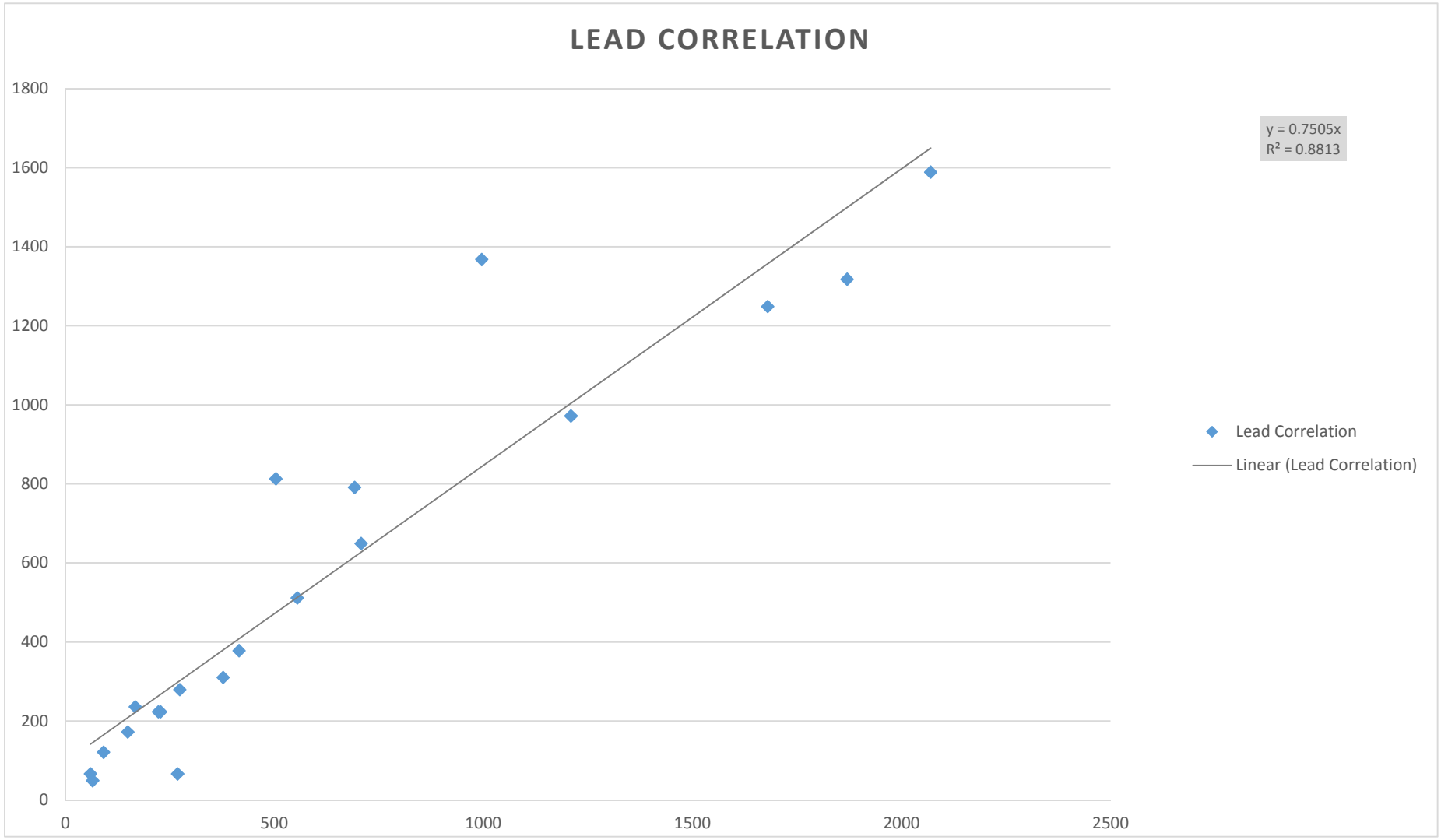
- Above Regional Screening Level

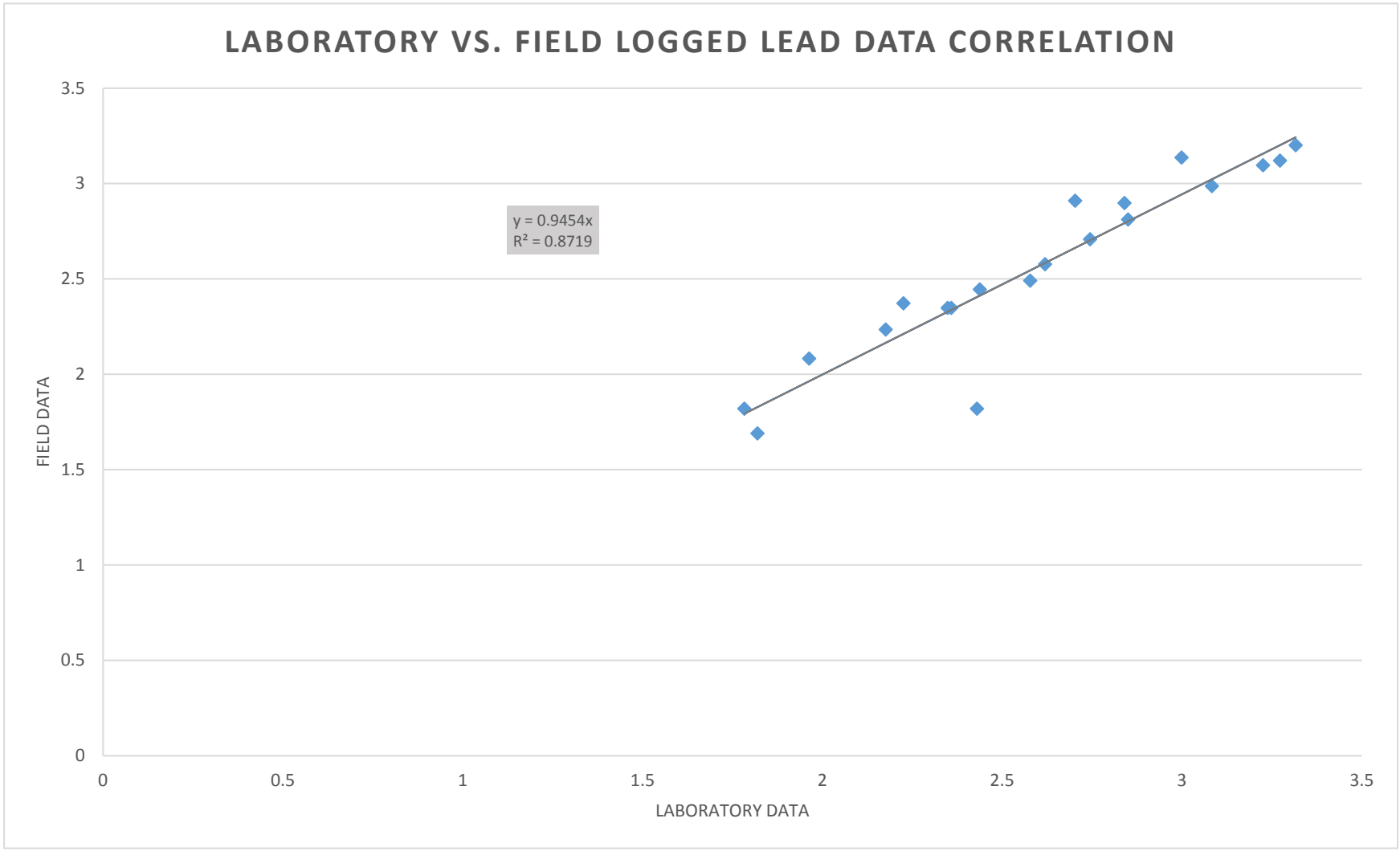
bgs - below ground surface
mg/kg - milligrams per kilogram

Bold - Detection

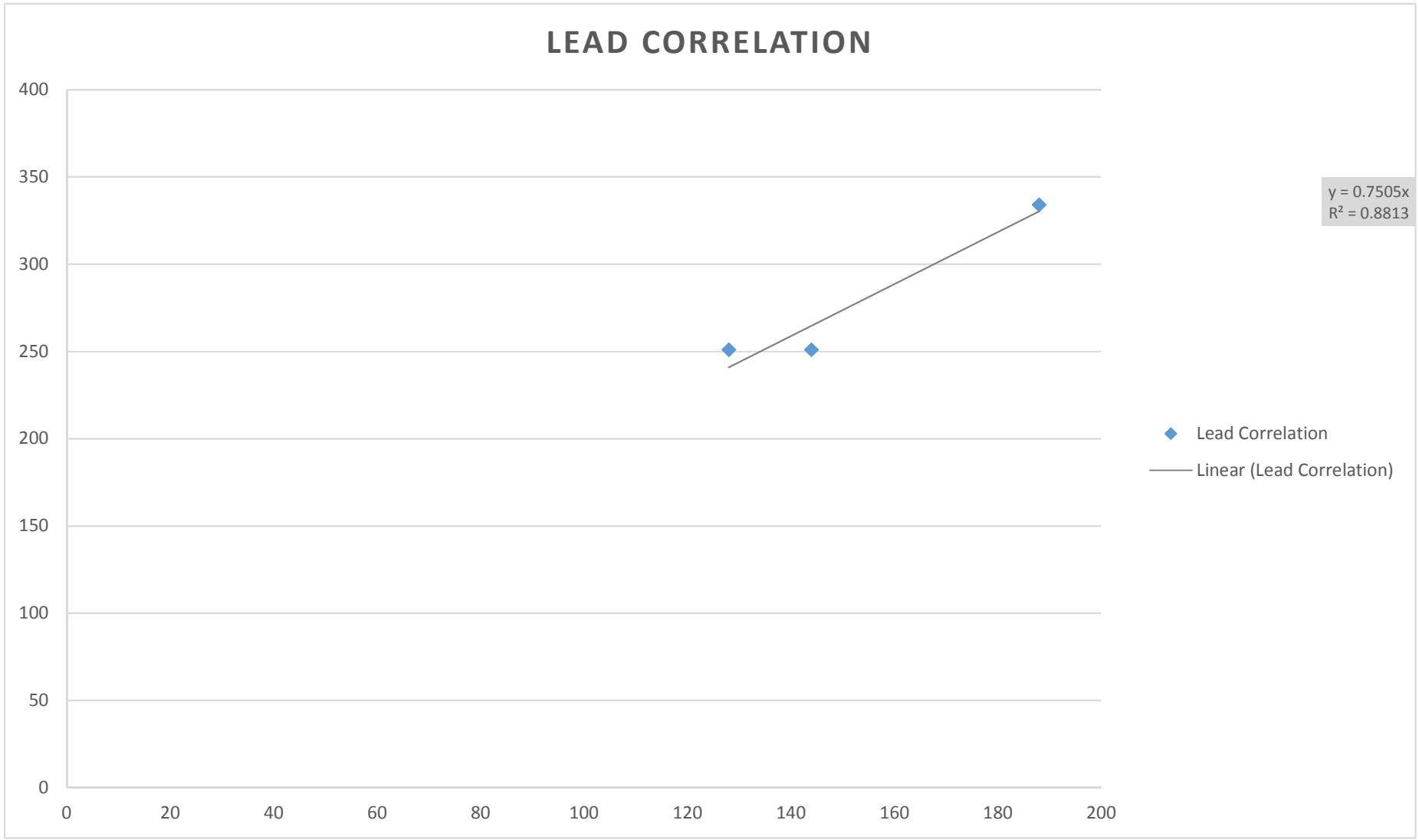
Non Bold - represents the method detection limit for samples not detected. Method detection limits were used because results could be up to or equal to the method detection limit without being detected and zero was not considered a correct representation.

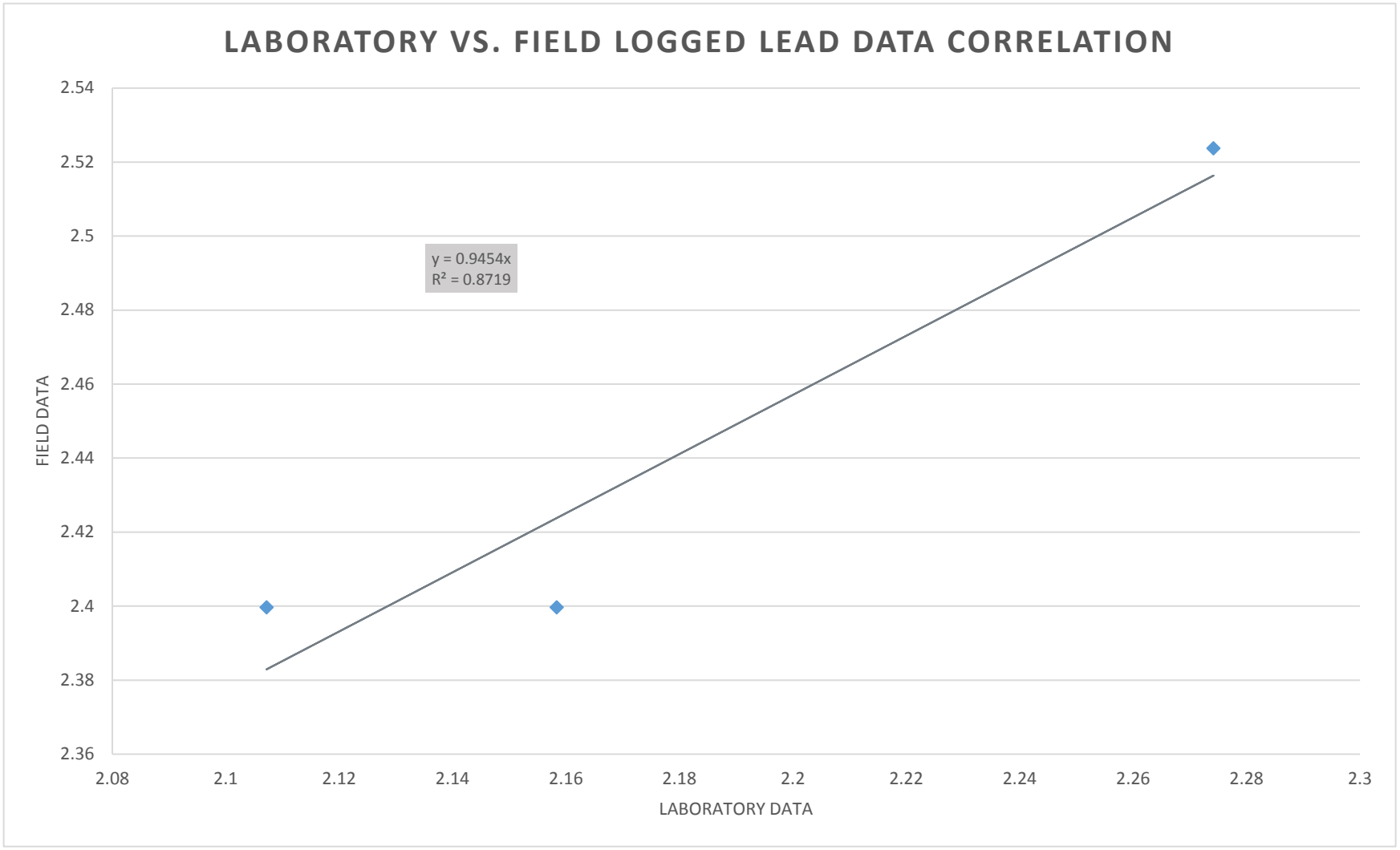
All metals concentrations reported in mg/kg.


LEAD CORRELATION
1800
1600
1400
1200
1000
800
600
400
200
0
0
500
1000
1500
2000
2500
y = 0.7505x
R² = 0.8813
Lead Correlation
Linear (Lead Correlation)


LABORATORY VS. FIELD LOGGED LEAD DATA CORRELATION
y = 0.9454x
R² = 0.8719
FIELD DATA
LABORATORY DATA
0
0.5
1
1.5
2
2.5
3
3.5

ASR_Numb	Sample_Nu	QC_Code	Analyte_Nam	Units	Lab_Result	XRF_Avg	Location_Desc	Log Lab	Log XRF
7543	1	__	Lead	mg/kg	378	310	CCR-SO-35-18-24	2.577492	2.491362
7543	2	__	Lead	mg/kg	168	236	CCR-SO-36-12-18	2.225309	2.372912
7543	3	__	Lead	mg/kg	66	49	CCR-SO-36-18-24	1.819544	1.690196
7543	4	__	Lead	mg/kg	274	279	CCR-SS-40-0-6	2.437751	2.445604
7543	5	__	Lead	mg/kg	91.8	121	CCR-SO-41-6-12	1.962843	2.082785
7543	6	__	Lead	mg/kg	555	511	CCR-SS-42-0-6	2.744293	2.708421
7543	7	__	Lead	mg/kg	504	813	CCR-SS-43-0-6	2.702431	2.910091
7543	8	FD	Lead	mg/kg	228	223	CCR-SS-44-0-6	2.357935	2.348305
7543	8	__	Lead	mg/kg	223	223	CCR-SS-44-0-6	2.348305	2.348305
7543	9	__	Lead	mg/kg	692	791	CCR-SO-47-6-12	2.840106	2.898176
7543	10	__	Lead	mg/kg	708	649	CCR-SO-51-12-18	2.850033	2.812245
7543	11	__	Lead	mg/kg	416	378	CCR-SO-51-18-24	2.619093	2.577492
7543	12	FD	Lead	mg/kg	269	66	CCR-SS-52-0-6	2.429752	1.819544
7543	12	__	Lead	mg/kg	60.7	66	CCR-SS-52-0-6	1.783189	1.819544
7543	13	__	Lead	mg/kg	150	172	CCR-SO-52-18-24	2.176091	2.235528
7543	14	__	Lead	mg/kg	1870	1318	CCR-SS-53-0-6	3.271842	3.119915
7543	15	__	Lead	mg/kg	1210	972	CCR-SO-53-6-12	3.082785	2.987666
7543	16	__	Lead	mg/kg	2070	1589	CCR-SO-54-12-18	3.31597	3.201124
7543	17	__	Lead	mg/kg	996	1368	CCR-SS-55-0-6	2.998259	3.136086
7543	18	__	Lead	mg/kg	1680	1249	CCR-SS-56-0-6	3.225309	3.096562


LEAD CORRELATION
400
350
300
250
200
150
100
50
0
0
20
40
60
80
100
120
140
160
180
200
y = 0.7505x
R² = 0.8813
Lead Correlation
Linear (Lead Correlation)


LABORATORY VS. FIELD LOGGED LEAD DATA CORRELATION
y = 0.9454x
R² = 0.8719
FIELD DATA
LABORATORY DATA
2.54
2.52
2.5
2.48
2.46
2.44
2.42
2.4
2.38
2.36
2.08
2.1
2.12
2.14
2.16
2.18
2.2
2.22
2.24
2.26
2.28
2.3

ASR_Numb	Sample_Numb	QC_Code	Analyte_Nam	Units	Lab_Result	XRF_Avg	Location_Desc	Log Lab	Log XRF
7791	1		Pb	mg/kg	144	251	CCR-SS-38-0-6	2.158362	2.399674
7791	1	FD		mg/kg	128	251	CCR-SS-38-0-6	2.10721	2.399674
7791	3		Pb	mg/kg	188	334	CCR-SO-39-12-18	2.274158	2.523746

	35						36						38					
	1		2		3		1		2		3		1		2		3	
Depth/Analyte	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**
0-6 inches																		
Pb	283	36	424	42	459	47	348	42	384	41	389	41	253	20	209	18	291	21
Zn	4485	153	4289	148	5279	175	8769	232	6726	188	7228	191	3495	84	1886	59	2852	73
6-12 inches																		
Pb	347	40	454	45	436	45	230	31	278	35	274	69	209	18	179	18	204	17
Zn	6795	195	5636	172	5426	174	5150	161	6114	178	5951	180	3019	76	2647	74	3638	81
12-18 inches																		
Pb	373	48	448	47	546	52	198	33	199	29	313	37	248	20	124	14	253	21
Zn	6345	217	5019	173	6338	195	5697	191	5315	163	6519	185	2390	68	2855	72	2730	75
18-24 inches																		
Pb	310	44	275	34	346	39	73	19	65	19	26	13	84	12	52	11	38	11
Zn	4417	182	3348	130	5002	163	4800	159	9477	230	2659	119	694	37	381	31	288	30
24-30 inches																		
Pb	239	41	249	40	541	51	26	13	32	16	<17.6		12	6	11	6	8	6
Zn	2448	143	3552	165	4405	161	385	48	582	63	96	31	21	10	40	21	24	10
30-36 inches																		
Pb	230	35	241	34	304	38												
Zn	5000	173	2780	124	3245	135												
36-42 inches																		
Pb	398	43	375	40	254	34												
Zn	5168	168	3520	135	3068	128												
42-48 inches																		
Pb	36	18	72	31	103	27												
Zn	3559	174	1979	161	1189	97												
West																		
Pb							76	25	71	22	94	29	21	7	18	7	17	7
Zn							1479	115	961	82	1061	102	126	17	116	16	102	16
East																		
Pb							135	27	102	33	101	25	30	8	27	8	35	8
Zn							1947	110	1692	141	2309	128	305	25	232	21	232	2

	39						40						41					
	1		2		3		1		2		3		1		2		3	
Depth/Analyte	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**
0-6 inches																		
Pb	232	19	210	18	240	19	289	37	281	34	268	35	111	22	92	21	73	19
Zn	3856	83	5382	99	4256	88	4941	167	3750	135	4849	164	1841	95	1106	76	1580	89
6-12 inches																		
Pb	367	24	480	27	366	24	325	37	299	38	422	42	109	22	109	22	147	25
Zn	2336	68	2236	66	2812	76	3739	139	5687	179	5194	163	1709	91	2373	107	2723	112
12-18 inches																		
Pb	519	33	229	26	354	24	<24.6		10	11	<24.1		27	14	23	13	<15.9	
Zn	3926	101	3202	80	3540	82	680	101	978	71	1126	125	292	44	361	48	333	42
18-24 inches																		
Pb	34	8	94	13	46	9	68	18	195	28	173	29	<24.2		21	12	<15.3	
Zn	408	27	450	31	322	25	1116	76	2158	101	1726	99	206	52	504	35	224	36
24-30 inches																		
Pb	10	6	15	7	6	5												
Zn	304	24	477	30	313	24												
30-36 inches																		
Pb																		
Zn																		
36-42 inches																		
Pb																		
Zn																		
42-48 inches																		
Pb																		
Zn																		
West																		
Pb																		
Zn																		
East																		
Pb																		
Zn																		

	42						43						44					
	1		2		3		1		2		3		1		2		3	
Depth/Analyte	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**
0-6 inches																		
Pb	445	49	580	57	509	48	418	42	1459	79	562	48	254	34	190	31	225	34
Zn	2277	121	3241	147	2312	111	7240	189	5925	175	3828	138	2629	120	2234	113	2395	121
6-12 inches																		
Pb	473	44	421	44	421	46	352	37	586	50	361	39	154	28	113	29	93	23
Zn	2464	111	2324	114	11100	300	4454	143	5267	165	3308	128	2028	107	1205	99	710	68
12-18 inches																		
Pb	74	24	52	23	59	22	163	30	104	22	254	32	<17.7		29	13	<15.4	
Zn	973	88	441	72	1101	99	2713	130	781	65	1850	94	219	37	229	37	173	30
18-24 inches																		
Pb	50	20	32	21	38	19	<19.3		<38.2		<23.1		<20.6		<21.8		35	17
Zn	438	61	339	67	254	48	539	65	581	104	700	79	204	42	192	42	113	34
24-30 inches																		
Pb																		
Zn																		
30-36 inches																		
Pb																		
Zn																		
36-42 inches																		
Pb																		
Zn																		
42-48 inches																		
Pb																		
Zn																		
West																		
Pb							300	44	286	40	230	33						
Zn							834	80	1062	86	816	68						
East																		
Pb							100	26	83	26	75	21						
Zn							668	73	579	71	808	73						

	45						46						47					
	1		2		3		1		2		3		1		2		3	
Depth/Analyte	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**
0-6 inches																		
Pb	157	29	138	30	195	35	29	13	47	16	67	19	575	58	444	51	643	52
Zn	2424	121	2478	135	2534	137	2588	115	2831	124	5139	168	13500	300	11600	300	5725	172
6-12 inches																		
Pb	115	26	105	27	112	28	133	26	25	12	37	13	1011	70	762	58	600	53
Zn	1973	114	583	69	583	69	1393	89	305	40	321	40	13800	300	13400	300	13700	300
12-18 inches																		
Pb	<16.3		<16.8		<15.7		38	14	<15.3		21	12	32	14	19	12	<18.4	
Zn	93	26	159	40	95	25	339	40	202	34	151	30	511	54	519	53	211	38
18-24 inches																		
Pb	<14.7		<13.8		19	12							37	15	29	14	34	18
Zn	74	21	74	22	71	24							377	49	198	37	418	61
24-30 inches																		
Pb																		
Zn																		
30-36 inches																		
Pb																		
Zn																		
36-42 inches																		
Pb																		
Zn																		
42-48 inches																		
Pb																		
Zn																		
West																		
Pb							331	44	342	46	303	44						
Zn							3848	164	3997	171	3117	155						
East																		
Pb							185	28	180	28	180	28						
Zn							1921	99	3291	128	2057	102						

	48						49						50					
	1		2		3		1		2		3		1		2		3	
Depth/Analyte	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**
0-6 inches																		
Pb	366	49	530	52	912	63	456	34	379	40	361	38	152	28	130	26	158	37
Zn	3388	165	6180	194	4826	159	5382	161	3540	133	4125	142	648	63	484	54	632	81
6-12 inches																		
Pb	327	37	685	55	641	57	521	48	634	54	752	60	43	16	26	13	35	13
Zn	9007	210	9178	219	12700	300	4603	156	4520	159	4293	157	188	35	178	33	219	34
12-18 inches																		
Pb	21	13	58	23	56	19	339	37	272	40	367	45	1205	74	1367	78	1310	76
Zn	296	43	756	87	537	59	7106	187	6599	215	7437	220	1789	100	3032	129	4083	148
18-24 inches																		
Pb	<15.3		21	12	<15.4		40	15	24	12	<15.3		495	46	398	42	772	60
Zn	70	23	55	21	94	25	197	33	163	30	90	24	11800	200	10400	200	10200	200
24-30 inches																		
Pb													352	40	545	51	436	45
Zn													6831	194	13700	300	10100	200
30-36 inches																		
Pb													53	29	84	34	43	17
Zn													711	109	1003	122	549	62
36-42 inches																		
Pb													53	29	84	34	43	17
Zn													711	109	1003	122	549	62
42-48 inches																		
Pb													53	29	84	34	43	17
Zn													711	109	1003	122	549	62
West																		
Pb	43	16	40	15	31	15												
Zn	115	31	170	32	109	31												
East																		
Pb	264	35	585	55	488	52												
Zn	769	66	1352	91	957	80												

	51						52						53					
	1		2		3		1		2		3		1		2		3	
Depth/Analyte	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**
0-6 inches																		
Pb	61	19	58	19	49	16	54	18	117	24	28	15	1309	72	1107	66	1582	79
Zn	953	77	641	66	610	58	2575	126	1166	82	859	75	844	64	683	58	1921	97
6-12 inches																		
Pb	307	33	360	44	180	30	40	15	35	15	37	17	952	66	1036	67	930	64
Zn	3383	140	4319	165	5386	174	974	72	795	69	447	60	848	69	1270	88	1149	79
12-18 inches																		
Pb	917	65	493	47	538	50	70	20	31	13	243	34	443	49	540	47	440	48
Zn	4961	166	5466	170	4667	161	1300	88	689	62	3455	141	897	77	1233	78	762	70
18-24 inches																		
Pb	359	42	356	42	420	45	212	33	133	27	173	34	26	14	32	13	32	13
Zn	8492	223	11600	300	12800	300	4129	156	2814	133	3661	169	463	56	513	52	604	56
24-30 inches																		
Pb	22	13	60	19	23	13	55	19	83	22	2928	118						
Zn	512	58	1562	99	1240	88	2843	141	2926	138	4645	164						
30-36 inches																		
Pb							239	40	65	18	281	42						
Zn							3306	162	5015	63	4169	175						
36-42 inches																		
Pb							<15.2		20	13	<15.2							
Zn							132	34	182	37	179	40						
42-48 inches																		
Pb																		
Zn																		
West																		
Pb	31	16	84	25	41	16												
Zn	151	34	204	44	137	30												
East																		
Pb																		
Zn																		

	54						55						56					
	1		2		3		1		2		3		1		2		3	
Depth/Analyte	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**	**Result**	**±**
0-6 inches																		
Pb	1124	70	1178	72	1156	69	1205	72	1460	77	1440	77	1540	57	880	60	1327	71
Zn	5193	166	3368	134	3737	136	510	53	359	43	421	48	736	44	373	45	545	52
6-12 inches																		
Pb	1894	94	1616	80	1570	78	166	28	297	40	230	34	367	41	64	20	166	26
Zn	1737	100	1563	87	2455	108	779	65	811	72	757	68	914	71	1072	82	1025	71
12-18 inches																		
Pb	1869	87	1825	93	1074	74	42	18	66	17	36	15	90	20	77	21	24	14
Zn	2047	101	2403	118	1022	81	400	54	498	49	306	44	604	56	591	60	419	52
18-24 inches																		
Pb	510	47	675	67	673	68												
Zn	674	59	899	86	699	78												
24-30 inches																		
Pb	186	30	371	42	157	30												
Zn	1017	77	1144	82	802	72												
30-36 inches																		
Pb																		
Zn																		
36-42 inches																		
Pb																		
Zn																		
42-48 inches																		
Pb																		
Zn																		
West													**N**					
Pb													32	13	51	16	100	22
Zn													402	46	673	58	773	64
East													**S**					
Pb													523	50	329	40	403	44
Zn													364	47	419	51	438	52

United States Environmental Protection Agency
Region 7
300 Minnesota Avenue
Kansas City, KS 66101

Date: 11/16/2017

Subject: Transmittal of Sample Analysis Results for ASR #: 7543

Project ID: EH073708

Project Description: Cherokee County - Railroads sampling

From: Margaret E.W. St. Germain, Chief
Laboratory Technology & Analysis Branch, Environmental Sciences & Technology Division

To: Elizabeth Hagenmaier
SUPR/LMSE

Enclosed are the analytical data for the above-referenced Analytical Services Request (ASR) and Project. The Regional Laboratory has reviewed and verified the results in accordance with procedures described in our Quality Manual (QM). In addition to all of the analytical results, this transmittal contains pertinent information that may have influenced the reported results and documents any deviations from the established requirements of the QM.

Please contact us within 14 days of receipt of this package if you determine there is a need for any changes. Please complete the Online ASR Sample/Data Disposition and Customer Survey for this ASR as soon as possible. The process of disposing of the samples for this ASR will be initiated 30 days from the date of this transmittal unless an alternate release date is specified on the Online ASR Sample/Data Disposition and Customer Survey.

If you have any questions or concerns relating to this data package, contact our customer service line at 913-551-5295.

Enclosures

cc: Analytical Data File.

Project Manager: Elizabeth Hagenmaier Org: SUPR/LMSE Phone: 913-551-7939

Project ID: EH073708 QAPP Number: 2017167

Project Desc: Cherokee County - Railroads sampling

Location: Cherokee County State: Kansas Program: Superfund

Site Name: CHEROKEE COUNTY - RAILROADS Site ID: 0737 Site OU: 08

Purpose: Site Characterization GPRA PRC: 000DD2

PM/Sampler noted on submitted ASR that it is not part of a litigation hold activity at this time.

Explanation of Codes, Units and Qualifiers used on this report

Sample QC Codes: QC Codes identify the type of sample for quality control purpose.

__ = Field Sample
FD = Field Duplicate

Units: Specific units in which results are reported.

% = Percent
mg/kg = Milligrams per Kilogram

Data Qualifiers: Specific codes used in conjunction with data values to provide additional information on the quality of reported results, or used to explain the absence of a specific value.

(Blank) = Values have been reviewed and found acceptable for use.
J = The identification of the analyte is acceptable; the reported value is an estimate.

Project ID: EH073708 Project Desc: Cherokee County - Railroads sampling

Sample No	QC Code	Matrix	Location Description	External Sample No	Start Date	Start Time	End Date	End Time	Receipt Date
1	__	Solid	CCR-SO-35-18-24		06/14/2017	11:45			11/06/2017
2	__	Solid	CCR-SO-36-12-18		06/14/2017	12:20			11/06/2017
3	__	Solid	CCR-SO-36-18-24		06/14/2017	12:30			11/06/2017
4	__	Solid	CCR-SS-40-0-6		06/13/2017	15:20			11/06/2017
5	__	Solid	CCR-SO-41-6-12		06/13/2017	13:10			11/06/2017
6	__	Solid	CCR-SS-42-0-6		06/13/2017	12:40			11/06/2017
7	__	Solid	CCR-SS-43-0-6		06/13/2017	11:50			11/06/2017
8	__	Solid	CCR-SS-44-0-6		06/13/2017	11:15			11/06/2017
8	FD	Solid	CCR-SS-44-0-6	Field Duplicate -8	06/13/2017	11:20			11/06/2017
9	__	Solid	CCR-SO-47-6-12		06/13/2017	14:20			11/06/2017
10	__	Solid	CCR-SO-51-12-18		06/14/2017	09:30			11/06/2017
11	__	Solid	CCR-SO-51-18-24		06/14/2017	09:40			11/06/2017
12	__	Solid	CCR-SS-52-0-6		06/14/2017	10:15			11/06/2017
12	FD	Solid	CCR-SS-52-0-6	Field Duplicate -12	06/14/2017	10:18			11/06/2017
13	__	Solid	CCR-SO-52-18-24		06/14/2017	10:20			11/06/2017
14	__	Solid	CCR-SS-53-0-6		06/14/2017	14:35			11/06/2017
15	__	Solid	CCR-SO-53-6-12		06/14/2017	14:40			11/06/2017
16	__	Solid	CCR-SO-54-12-18		06/14/2017	14:20			11/06/2017
17	__	Solid	CCR-SS-55-0-6		06/14/2017	16:30			11/06/2017
18	__	Solid	CCR-SS-56-0-6		06/14/2017	16:20			11/06/2017

Analysis	Comments About Results For This Analysis

1 Metals in Solids by ICP-AES

Lab: Region 7 EPA Laboratory - Kansas City, Ks.

Method: EPA Region 7 RLAB Method 3122.3F

Basis: Dry

Samples:							
	1-__	2-__	3-__	4-__	5-__	6-__	7-__
	8-__	8-FD	9-__	10-__	11-__	12-__	12-FD
	13-__	14-__	15-__	16-__	17-__	18-__	

Comments:
Lead was J-coded in sample 3. Although the analyte in question has been positively identified in the sample, the quantitation is an estimate (J-coded) due to high recovery of this analyte in the laboratory matrix spike. The actual concentration for this analyte may be lower than the reported value.

1 Percent Solid

Lab: Region 7 EPA Laboratory - Kansas City, Ks.

Method: EPA Region 7 RLAB Method 3142.9H

Basis: N/A

Samples:							
	1-__	2-__	3-__	4-__	5-__	6-__	7-__
	8-__	8-FD	9-__	10-__	11-__	12-__	12-FD
	13-__	14-__	15-__	16-__	17-__	18-__	

Comments:
(N/A)

Analysis/ Analyte	Units	1-__	2-__	3-__	4-__
1 Metals in Solids by ICP-AES					
Lead	mg/kg	378	168	66.0 J	274
Zinc	mg/kg	4520	6440	5040	3190
1 Percent Solid					
Solids, percent	%	91.2	93.2	93.7	96.6

Analysis/ Analyte	Units	5-__	6-__	7-__	8-__
1 Metals in Solids by ICP-AES					
Lead	mg/kg	91.8	555	504	223
Zinc	mg/kg	1970	3470	3490	1980
1 Percent Solid					
Solids, percent	%	93.2	94.8	96.2	90.2

Analysis/ Analyte	Units	8-FD	9-__	10-__	11-__
1 Metals in Solids by ICP-AES					
Lead	mg/kg	228	692	708	416
Zinc	mg/kg	1890	6060	5040	5770
1 Percent Solid					
Solids, percent	%	91.8	96.7	96.6	94.6

Project ID: EH073708 Project Desc: Cherokee County - Railroads sampling

Analysis/ Analyte	Units	12-__	12-FD	13-__	14-__
1 Metals in Solids by ICP-AES					
Lead	mg/kg	60.7	269	150	1870
Zinc	mg/kg	1290	4570	2990	3130
1 Percent Solid					
Solids, percent	%	93.1	94.4	96.0	97.0

Project ID: EH073708 Project Desc: Cherokee County - Railroads sampling

Analysis/ Analyte	Units	15-__	16-__	17-__	18-__
1 Metals in Solids by ICP-AES					
Lead	mg/kg	1210	2070	996	1680
Zinc	mg/kg	1890	2810	1080	2610
1 Percent Solid					
Solids, percent	%	94.0	91.9	97.7	97.5

United States Environmental Protection Agency
Region 7
300 Minnesota Avenue
Kansas City, KS 66101

Date: 03/14/2018

Subject: Transmittal of Sample Analysis Results for ASR #: 7791

Project ID: EH073708

Project Description: Cherokee County - Railroads sampling

From: Margaret E.W. St. Germain, Chief
Laboratory Technology & Analysis Branch, Environmental Sciences & Technology Division

To: Elizabeth Hagenmaier
SUPR/LMSE

Enclosed are the analytical data for the above-referenced Analytical Services Request (ASR) and Project. The Regional Laboratory has reviewed and verified the results in accordance with procedures described in our Quality Manual (QM). In addition to all of the analytical results, this transmittal contains pertinent information that may have influenced the reported results and documents any deviations from the established requirements of the QM.

Please contact us within 14 days of receipt of this package if you determine there is a need for any changes. Please complete the Online ASR Sample/Data Disposition and Customer Survey for this ASR as soon as possible. The process of disposing of the samples for this ASR will be initiated 30 days from the date of this transmittal unless an alternate release date is specified on the Online ASR Sample/Data Disposition and Customer Survey.

If you have any questions or concerns relating to this data package, contact our customer service line at 913-551-5295.

Enclosures

cc: Analytical Data File.

Project Manager: Elizabeth Hagenmaier Org: SUPR/LMSE Phone: 913-551-7939

Project ID: EH073708 QAPP Number: 2017167

Project Desc: Cherokee County - Railroads sampling

Location: Cherokee County State: Kansas Program: Superfund

Site Name: CHEROKEE COUNTY - RAILROADS Site ID: 0737 Site OU: 08

Purpose: Site Characterization GPRA PRC: 000DD2

PM/Sampler noted vial email dated: 2/12/2018 that this ASR is not part of a litigation hold activity at this time.

Explanation of Codes, Units and Qualifiers used on this report

Sample QC Codes: QC Codes identify the type of sample for quality control purpose.

__ = Field Sample
FD = Field Duplicate

Units: Specific units in which results are reported.

mg/kg = Milligrams per Kilogram
% = Percent

Data Qualifiers: Specific codes used in conjunction with data values to provide additional information on the quality of reported results, or used to explain the absence of a specific value.

(Blank) = Values have been reviewed and found acceptable for use.
J = The identification of the analyte is acceptable; the reported value is an estimate.

Project ID: EH073708 Project Desc: Cherokee County - Railroads sampling

Sample No	QC Code	Matrix	Location Description	External Sample No	Start Date	Start Time	End Date	End Time	Receipt Date
1	__	Solid	CCR-SS-38-0-6		02/28/2018	11:45			03/01/2018
1	FD	Solid	CCR-SS-38-0-6		02/28/2018	11:45			03/01/2018
3	__	Solid	CCR-SO-39-12-18		02/28/2018	12:41			03/01/2018

Analysis	Comments About Results For This Analysis

1 Metals in Solids by ICP-AES

Lab: Region 7 EPA Laboratory - Kansas City, Ks.

Method: EPA Region 7 RLAB Method 3122.3F

Basis: Dry

Samples: 1-__ 1-FD 3-__

Comments:
Zinc was J-coded in sample 1. Although the analyte in question has been positively identified in the sample, the quantitation is an estimate (J-coded) due to high recovery of this analyte in the laboratory matrix spike. The actual concentration for this analyte may be lower than the reported value.

1 Percent Solid

Lab: Region 7 ESAT Contract Lab (In-House)

Method: EPA Region 7 RLAB Method 3142.9H

Basis: N/A

Samples: 1-__ 1-FD 3-__

Comments:
(N/A)

Project ID: EH073708 Project Desc: Cherokee County - Railroads sampling

Analysis/ Analyte	Units	1-__	1-FD	3-__
1 Metals in Solids by ICP-AES				
Lead	mg/kg	144	128	188
Zinc	mg/kg	1820 J	2160	4620
1 Percent Solid				
Solids, percent	%	96.2	95.7	93.9

Sample Location	Property Owner, Contact Information	Parcel #
35	Brent R Mishler 4845 SE 60th Galena, KS 66739	011-196-13-0-00-00-016.00-0
36		
38	Kenneth B Outt 7648 SE Messer Rd, Galena, KS 66739	011-119-29-0-00-00-002.00-0
39		
40	Lena & Robert B McBeth 515 S 41st St, Boulder, CO 80305	011-114-20-0-00-00-001.01-0
41	Ozark Regional Land Trust PO Box 1512, Columbia, MO 65205	011-115-16-0-00-00-005.00-0
42		011-115-16-0-00-00-009.00-0
43		011-112-04-0-00-00-005.00-0
44		011-112-03-0-00-00-005.00-0
45		
46		
46	Garnett Doss 458 Joplin St, Asbury, MO 64832	011-107-35-0-00-00-008.00-0
47	Kenneth D Clark, Jr. Revocable Trust, 7457 SE Messer Rd Galena, KS 66739	011-115-21-0-00-00-002.00-0
48		011-107-25-0-00-00-011.00-0
52		011-118-33-0-00-00-001.00-0
49 & 50	Willard Edward Watkins, 7750 SE 76th St, Galena, KS 66739	011-118-28-0-00-00-010.01-0
51	Rick Jessee & Patricia Crossland Holding Co PO Box 45 Clumbus, KS 66725	011-118-33-0-00-00-001.00-0
53	Roger Wayne Porter Roberta Jean Porter 2318 W 21st St Galena, KS 66739	011-208-27-0-00-00-008.00-0
54		
55	William E Gandy Jr 7730 SE 85th St Galena, KS 66739	011-208-28-0-00-00-015.01-0
56		

ATTACHMENT 7
ECOLOGICAL CHARACTERIZATION

(Provided on CD)